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An Address
ON
FAULTY FOOD IN RELATION TO GASTRO-INTESTINAL DISORDER.

Being the Sixth Mellon Lecture delivered before the Society of Biological Research, University of Pittsburg, Nov. 18th, 1921,

BY ROBERT McCARRISON, M.D. R.U.I., D.Sc., LL.D. BELF., F.R.C.P. LOND.,
LIEUT.-COLONEL, I.M.S.; IN CHARGE OF DEFICIENCY DISEASES INQUIRY, INDIAN RESEARCH FUND ASSOCIATION.

I PROPOSE in this lecture to propound the thesis that much of the gastro-intestinal disorder of civilised peoples at the present day is due to faulty food. In doing so I shall present evidence of the incidence of such disorder among civilised communities and of its comparative absence among certain races living under more natural conditions; and contrast, in general terms, the food habits of the former with those of the latter. I shall refer to the special relation of perfect food to the functional perfection of the gastro-intestinal tract; and from these sources advance presumptive evidence of the effects of faulty food in impairing the functional perfection of the digestive system. Experimental evidence of these effects will then be given and attention directed to the applicability of the experimental results to the genesis of certain acute and chronic gastro-intestinal disorders. Finally, I shall argue that faulty foods, capable of causing similar effects in man to those produced experimentally in animals, are widely made use of at the present day. Having thus introduced the subject to your notice as students of public health I shall leave you to examine for yourselves in the wards, the clinic, and the home the truth of the doctrine I have propounded.

PREVALENCE OF GASTRO-INTESTINAL DISEASE.

It was recently stated by a public health administrator in England that 25 per cent. of all cases seeking relief at our clinics did so for gastro-intestinal disorders. So far as my memory serves me the statement was made in order to emphasise the necessity for a study of the ætiological factors concerned in the production of this great mass of sickness. It has, too, been pointed out within the last few months that the alarming increase of cancer among town-dwellers in Great Britain is due, in the main, to the increasing prevalence of gastro-intestinal cancer. These facts demand the close attention of all students of public health, for if by any means we can prevent gastro-intestinal disorders we shall relieve civilised communities of one-quarter of their sufferings.

In the fascinating pursuit of pathogenic organisms as causes of disease we are apt to overlook the claims upon our consideration of sufferers from non-infectious maladies—the claims, for instance, of the dyspeptic or of the sufferer from colonic disease. Possibly this is due to the fact that the dyspeptic rarely dies of dyspepsia nor the subject of colonic disease from colitis. Their discomforts, not being catching, are no more to their neighbours than a source of irritation; consequently their claims on the consideration of the hygienist are overshadowed by the multitude's demand for the elimination of the microbe. The multitude does not know, and we ourselves often forget, that the activities of the microbe as a pathogenic agent are very often dependent on those very conditions of life which give rise to the discomforts and sufferings of the victims of such maladies as indigestion and mucomembranous colitis. These conditions of life and of imperfect nutrition frequently prepare the soil of the body for the rank growth of bacterial agents. Fortunately, within the last few years the attention of investigators of disease has been directed into new channels of inquiry, channels which take cognisance of the influence of negative factors in the production of disease as well as of positive factors.

FOOD BALANCE AND DEFICIENCY DISEASES.

As is usual in any new development, advance has been made along narrow lines, but the stream of knowledge has gradually broadened, so that we are beginning to appreciate the wider significance of the negative factors in the production of disease in general. Chief amongst them is food deficient in some ingredient essential to the body's well-being, such, for instance, as vitamins, suitable protein, iodine, phosphorus, or calcium. It sometimes happens that one such essential is present in the food in insufficient quantity. Then metabolic harmony ceases or becomes discordant and "deficiency disease" results. It is necessary to emphasise that "deficiency disease" is not a question merely of deficiency of vitamins, but of deficiency of any essential requisite of a perfect food. Nor is this all, for in practice deficiency of one essential often means excess of another; such, for instance, as relative deficiency of vitamin B in the presence of an excess of starch or relative deficiency of iodine in the presence of an excess of fats; the excesses may themselves give rise to relative deficiencies of other essentials, especially of those present in the food in relatively small quantities. Lack of balance of the food is a fault second only in importance to actual want of some essential ingredient. The food faults met with in practice are thus often compounded of deficiencies in association with excesses. The importance of adequate food-balance is illustrated by even the purest of "deficiency diseases" such as scurvy, concerning which Pitz and Lewis have shown that adequate provision of other food essentials will delay in guinea-pigs the onset of scurvy, induced by lack of vitamin C, and prolong their life. The same is true of other deficiency diseases, such as polyneuritis columbarum, induced by lack of vitamin B. My own researches have impressed the importance of perfect food-balance upon me with increasing force within the last few months, since I have been able to show that an excess of fats or of unsaturated oleic acid in the food may cause a relative deficiency of iodine and enlargement of the thyroid gland (goitre). It is necessary also, in this connexion, to recognise a further fact—namely, that one cannot in practice dissociate from the effects of deficient and ill-balanced foods, those of bacterial or protozoal agencies whose ravages have been made possible by the faulty food. My remarks to-day, therefore, are to be considered from these broader aspects—namely, of food deficiencies in association with food excesses and with the fortuitous intervention of microbic or other pathogenic organisms.

ABDOMINAL HEALTH IN CERTAIN HIMALAYAN RACES.

In considering gastro-intestinal disease in the mass the realisation is forced upon one that since it is so common it must have a very common cause. It is helpful, in endeavouring to ascertain the cause of a malady widely prevalent in one community or race, to contrast the conditions of life of such a community with those of another that is free, or comparatively free, from the malady in question. My own experiences have afforded me this opportunity in the case of gastro-intestinal disorders. For some nine years of my professional life my duties lay in a remote part of the Himalayas, amongst isolated races far removed from the refinements of civilisation. Certain of these races are of magnificent physique, preserving until late in life the characters of youth; they are unusually fertile and long-lived, and endowed with nervous systems of notable stability. Their longevity and fertility were, in the case of one of them, matters of such concern to the ruling chief, that he took me to task for what he considered to be my ridiculous eagerness to prolong the lives of the ancients of his people, among whom were many of my patients. The operation for senile cataract appeared to him a waste of my economic opportunities, and he tentatively suggested instead the introduction of some form of lethal chamber designed to remove from his

realms those who by reason of their age and infirmity were no longer of use to the community. Among another of these races the custom which required an eldest son on pain of death to carry in a conical basket his aged and decrepit parents to the top of a high rock from which to hurl them to destruction, has only died out within recent years under the protective influence of British rule; and the proverb "Every-man's basket for his son" still survives the custom.

During the period of my association with these peoples I never saw a case of asthenic dyspepsia, of gastric or duodenal ulcer, of appendicitis, of mucous colitis, or of cancer, although my operating list averaged over 400 operations a year. While I cannot aver that all these maladies were quite unknown I have the strongest reason for the assertion that they were remarkably infrequent. The occasions on which my attention was directed to the abdominal viscera of these people were of the rarest. I can, as I write, recall most of them—occasions when my assistance was called for in the relief of strangulated hernias, or to expel the ubiquitous parasite—*Ascaris lumbricoides*. Amongst these people the abdomen over-sensitive to nerve impressions, to fatigue, anxiety, or cold was unknown. Their consciousness of the existence of this part of their anatomy was, as a rule, related solely to the sensation of hunger. Indeed, their buoyant abdominal health has, since my return to the West, provided a remarkable contrast with the dyspeptic and colonic lamentations of our highly civilised communities. Searching for an explanation of this difference in incidence of gastro-intestinal disease in the two peoples I find it, in the main, in four circumstances: (1) Infants are reared as nature intended them to be reared—at the breast. If this source of nourishment fails they die; and at least they are spared the future gastro-intestinal miseries which so often have their origin in the first bottle. (2) The people live on the unsophisticated food of nature; milk, eggs, grains, fruit, and vegetables. I suppose that not one in a thousand of them has ever seen tinned salmon, chocolate, or a patent infant food; less sugar is imported into their country in a year than is used in a moderately-sized hotel of this city in a single day. (3) Their religion prohibits alcohol, and although they do not always lead in this respect a strictly religious life, nevertheless they are eminently a teetotal race. (4) Their manner of life requires the vigorous exercise of their bodies.

FAULTY FOOD.

Each one of these differences in the habits of my Himalayan friends, as compared with those of Western peoples, would form, in itself, a fitting subject for discourse; but I shall content myself with a brief consideration of the first two under the general heading of "faulty food." It is not that the races to which I have referred live under hygienic conditions superior, as to housing and conservancy, to those of the masses in the West; on the contrary, in both these respects their conditions of life are most primitive. Nor in their agricultural struggles with Nature have they acquired any peculiar immunity to the effects of faulty food; they are, indeed, as susceptible as others to these effects, as the following occurrence illustrates. It fell out that the cultivatable lands of one of these races were no longer sufficiently extensive for the increasing population. To meet this it was decided to colonise another tract never previously cultivated. A dozen families were settled there and they made shift to grow upon its granite and infertile soil such grains as they could. My attention was directed to their efforts, and more especially to the results of them, when 10 out of 12 adult young men developed paralysis of the lower limbs due to lathyrism—a rare malady resulting from the disproportionate use in the food of the vetch *Lathyrus sativus*. These settlers, finding it impossible to grow a sufficiency of wheat, had cultivated the hardy vetch and used it in too high admixture with their scanty stores of wheat. The result was the development of paralysis of the lower limbs among the male population, while the female members of the settlement were unaffected. I mention this dramatic occurrence to show you that perfect physique and stability of the nervous system did not protect them from the effects of faulty food, and incidentally to emphasise the sex variations to be found in maladies resulting from food faults. For although in the case of lathyrism the difference in incidence of the disease in the two sexes is more marked than in any other nutritional malady known to me, yet it is in some nutritional diseases a very striking feature. We see, then, that as exemplified by certain Himalayan races and, as I find from recent reports in the medical press, by such races as those of Upper Egypt and Northern Nigeria, enforced restriction to the unsophisticated foodstuffs of nature is compatible with fertility, long life, continued vigour, perfect physique, and a remarkable freedom from digestive and gastro-intestinal disorders, and from cancer. I must confess that with these examples before me I find myself in accord with Hindhede, who affirms—and on unequivocal evidence—that the two chief causes of disease and death are food and drink.

CONTRAST OF PRIMITIVE AND CIVILISED DIET.

Let us now for a moment contrast the food of these primitive people with that of more highly civilised communities. The former are—or have to be—content with natural foods: milk, eggs, grains, fruits, and leafy vegetables. These natural foods—"the protective foods" as McCollum has named them—provide in proper quality and proportion the proximate principles and vitamins necessary for nutritional harmony, and the proper vegetable residues for the healthy evacuation of the bowels. But the case is different with civilised man. No longer is he content with the unsophisticated foods made in Nature's laboratory with "herbs bearing seed" and with "every tree in the which is the fruit of a tree yielding seed." To him these are still "for meat," but preserved, purified, polished, pickled, and canned. Some he extracts and distils with the object of procuring concentrates agreeable to his taste. His animal food he heats, dries, freezes, thaws, and stores. One way or another by desiccation, by chemicals, by heating, by freezing and thawing, by oxidation and decomposition, by milling and polishing, he applies the principles of his civilisation—the elimination of the natural and the substitution of the artificial—to the food he eats and fluids he drinks. With such skill does he do so that he often converts his food into a "dead" fuel mass, devoid of those vitamins which are to it as the magneto's spark to the fuel mixture of a petrol-driven engine. Unmindful, too, or more often ignorant, of the composition of the fuel-mixture with which he charges his human machine, he joins deficiencies of some essentials with excesses of others, heedless that the smooth running of his bodily functions bears intimate relation to the ordered balance of these essentials. I am not at the moment concerned with the circumstances of civilisation—expediency, penury, prejudice, ignorance, or habit—which have compelled man into this dangerous course; it is sufficient for my purpose that these circumstances exist, and that, in consequence of the food habits they have fostered, normal bodily function cannot be sustained, and—let me emphasise this point—gastro-intestinal function is one of the first to suffer. This truth is made manifest by the clinical evidences of disease that are first to appear in wild monkeys fed on deficient and ill-balanced food: loss of appetite, depraved appetite, vomiting, diarrhœa, dysentery, anæmia, unhealthy skin, asthenia, and loss of body-weight. If the faulty food be persisted in, other symptoms manifest themselves later, due, in the main, to malnutrition of the central nervous system; but it is the functions of the gastro-intestinal tract, the functions of digestion, absorption, and assimilation, that are among the first to fail in consequence of faulty food. These are the signs that our ship is running upon the rocks, and as good pilots we must be aware of them; I often think

that we are apt to assume more readily the office of salvors of wrecks than of pilots whose function it is to prevent them. Not only is functional failure of the digestive system an early evidence of faulty food, but the gastro-intestinal tract is often the first to exhibit clinical evidence of infection by pathogenic organisms in consequence of it. Let me illustrate this last point by an experience in my own laboratory. Thirty-six wild monkeys were captured in the jungles of Madras and transported with the least possible delay to my laboratory in the hills at Coonoor. They were in perfect health and full of vigour—wild things usually are. I had in these animals perfectly normal tissues to work upon: a unique opportunity to observe the first clinical and pathological effects on normal tissues of the agent—faulty food—with which I was working. Each of these animals was placed in a separate cage, and all were confined in the same animal room. One attendant looked after them all. Twelve of them were fed on natural food, the remainder were fed, some on food deficient in vitamins as well as ill-balanced; some on natural food in which the living essences had been destroyed by sterilisation. Those that were naturally fed remained free from intestinal disease; those that were fed on deficient and ill-balanced food and on sterilised food developed, within a short time in the majority of cases, diarrhœa or actual dysentery. Here, then, is an unequivocal instance not only of the effect of faulty food in inducing a specific disease such as dysentery, but of the protection against it that is afforded by a natural and well-balanced food.

PURPOSES OF FOOD.

Now let us consider for a moment the purposes which perfect food subserves. Every one recognises that food is taken into the body to repair tissue waste, to supply energy, and to provide the proper medium for the chemical reactions of the body. But do we always visualise these functions of food in relation to the organs of digestion themselves, and to the work to be done by the gastro-intestinal tract. If we did I think we should have no difficulty in realising the special effects on these organs of an insufficient supply of proteins which rebuild the digestive tissues and make good their waste, or of those constituents of the food which supply energy for the production of the digestive secretions and the movements of food along the digestive tract, or of salts which provide the proper medium for the chemical processes of digestion, or of vitamins which activate the cells of the digestive system to healthy function. The effects of deficiency of these essentials must of necessity be manifested in failures of digestive, absorptive, assimilative, and motor functions of this important region of the body. It is not necessary to make laboratory experimentation to prove that if a woman lives on white bread, margarine, condensed milk, and tea, with a minimum of imported meat and boiled potatoes, she is prone to suffer from such digestive disorders as dyspepsia and colonic disease. For such a diet does not contain a sufficiency of proteins to rebuild the tissues involved in digestion, assimilation, and evacuation of the bowel contents; it does not contain a sufficiency of vitamins to activate the cells of the digestive system to healthy function; it is ill-balanced, and by its excessive richness in starch it favours the development in the digestive tract of fermentative organisms, and makes relatively more deficient the vitamins necessary to healthy cellular action; nor does it contain a sufficiency of vegetable residue, of cellulose, waxes, and vegetable salts to ensure natural action of the bowels.

Nor do we, I think, always consider the dependency of one constituent of the food upon another for its share in the maintenance of nutritional harmony. We know that if such essentials as protein and inorganic salts be not provided in adequate quality and quantity growth must flag and repair of body waste must fail or cease; but do we realise that the utilisation of suitable protein and of suitable salts is dependent on the presence in the food of a sufficiency of vitamins? Or that the efficiency of vitamins is dependent in considerable measure on the adequate supply of these proximate principles? If the tissue waste of the gastro-intestinal tract be not made good—whether in consequence of insufficient supply of suitable protein or of its insufficient utilisation—then must the production of digestive juices fail, the mechanism of absorption and assimilation flag, the neuro-muscular control of the gastro-intestinal tract become inefficient, and the tissues of the tract become the prey of pathogenic organisms. It is thus that such a nutritional disease as pellagra may arise, and thus that the manifold varieties of gastro-intestinal disorder due to failure of digestive function may come into being. It is unwise to consider any of the essential ingredients of food, whether proteins, carbohydrates, fats, salts, water, or vitamins as independent of the assistance derivable from their associates in the maintenance of digestive and nutritional function. No doubt some of these have special relations to others, as, for instance, that of iodine to fats, that of vitamin B to carbohydrates, that of vitamin A to lipoids, calcium, and phosphorus-holding substances, and that of vitamin C to inorganic salts. But whatever be their special relations one to another they are all links in the chain of essential substances requisite for the harmonious regulation of life's processes; if one link be broken the harmony ceases or becomes discord. Of late the science of nutrition has tended to assume a too "vitaminic" outlook, and it is well to realise that important as these substances are man cannot live on vitamins or on proximate principles alone; each is complemental to the other, and deprivation of the one leads to starvation as surely as does deprivation of the other. Our knowledge of vitamins is still in the making, but it serves a useful purpose to have some mental conception of their function. I have likened it to the magneto's spark which ignites the fuel-mixture of a petrol-driven engine, liberating its energy; the spark is of no use without the fuel, nor the fuel without the spark—moreover, the efficacy of the spark is dependent in great measure on the composition of the fuel-mixture.

EXPERIMENTAL EVIDENCE.

But if I am to succeed in demonstrating the truth of my claim that faulty food is responsible for much of the gastro-intestinal ill-health so common at the present day, I must provide other than presumptive evidence of its effects on the digestive system, and convince you also that food having faults capable of causing these effects are nowadays extensively used by civilised communities.

For some years past I have been engaged in a study of the effects of deficient and ill-balanced food on the various organs and tissues of the body, as observable in animals fed on such foods under experimental conditions. Having reached certain conclusions with respect to the digestive organs and gastro-intestinal tract in such animals as pigeons, rats, and guinea-pigs, I repeated my experiments in wild monkeys captured in the jungles of Madras so that I might observe the effects of faulty foods on animals closely related to man. The foods I used were of several classes:—

1. Foods deficient in all three classes of vitamins, in suitable protein, in fats, and excessively rich in starch.
2. Foods deficient in vitamins B and C and excessively rich in starch and fats.
3. Foods deficient in vitamin C only, in vitamin B only, and in vitamins A and B, but well balanced in other respects.

These classes of food presented for my purpose an adequate range of deficiencies alone, and of deficiencies in combination with excesses; they include many of the food faults observable in the dietary of many civilised people at the present day. Let me now demonstrate on the screen the effects of these faulty foods on the digestive organs and gastro-intestinal tract. But before doing so I must point out very shortly the simultaneous effects to which they give

rise on the endocrine regulators of metabolism, the thyroid gland, the suprarenal gland, and the pituitary body; for it is to be remembered that the maintenance of healthy gastro-intestinal function is dependent in considerable measure on healthy endocrine action. It would carry me too far afield to develop adequately this latter theme; I content myself, therefore, with directing your attention to it, and with laying emphasis on the fact that it is necessary to consider in relation to the changes produced in the digestive system by faulty food those that are simultaneously produced by the same agency in the endocrine system. As an instance of this intimate correlation of digestive and endocrine function and disorder, I may refer to the simultaneous production by faulty food of colitis, of depreciation of liver function, and of adrenal derangement. The first is the most obvious clinical feature of the nutritional disturbance induced by the faulty food; the occurrence of the second may serve to account for the toxic symptoms from which the victims of mucous colitis suffer, and for the opinion held by some that mucous colitis is due to hepatic insufficiency; while the third suggests an explanation of the effects of fatigue, anxiety, and cold in precipitating attacks of mucous colitis in the mal-nourished subjects of colonic disease. The malady is, indeed, as much a disorder of the adrenal glands as of the colon.

The data afforded by the specimens I have just shown you [1] indicate that the profound changes resulting in the gastro-intestinal tract in consequence of the various deficient foods employed are similar in kind in the three species of animals I used—pigeons, guinea-pigs, and monkeys; it may be expected, therefore, that they will be similar in kind, if not in degree, in human beings whose dietaries have faults similar in kind if not in degree to those used in these experiments. I think there is good reason to believe that the prolonged use of a moderately faulty food will lead to them as certainly as the less prolonged use of a more faulty food. Without attempting to analyse them too closely or to attribute to each fault a specific effect, we may, I think, draw from them certain broad conclusions:—

1. The health of the gastro-intestinal tract is dependent on an adequate provision of vitamins. The absence of growth vitamins is capable of producing pathological changes in the tract which frequently assume the clinical form of colitis. This observation is of the highest importance in view of the frequency with which this malady is met with at the present day. Deficiency of vitamin C is especially concerned in the production of congestive and hæmorrhagic lesions in the tract, and evidences of these may be found in animals which have not exhibited during life any of the clinical manifestations of scurvy in noteworthy degree. A state of ill-health of the gastro-intestinal tract may thus be a pre-scorbutic manifestation of disease due to insufficiency of this vitamin, especially when associated with an excess of starch or fat or both in the food.

2. The disorder of the gastro-intestinal tract consequent on vitamin deficiency is enhanced when the food is ill-balanced.

3. The pathological processes resulting in this situation from deficient and ill-balanced foods are:—

(*a*) Congestive, necrotic, and inflammatory changes in the mucous membrane, involving sometimes the entire tract, sometimes limited areas of it.

(*b*) Degenerative changes in the neuro-muscular mechanism of the tract, tending to dilatation of the stomach, ballooning of areas of small and large bowel, and possibly also to intussusception.

(*c*) Degenerative changes in the secretory elements of the tract—of the gastric glands, the pyloric glands, the glands of Brunner, the glands of Lieberkuhn, and the mucous glands of the colon. These changes are such as must cause grave derangement of digestive and assimilative processes.

(*d*) Toxic absorption from the diseased bowel as evidenced by changes in the mesenteric glands.

(*e*) Impairment of the protective resources of the gastro-intestinal mucosa against infecting agents, due to hæmorrhagic infiltration, to atrophy of the lymphoid cells, and to imperfect production of gastro-intestinal juices. This impairment results not only in infections of the mucous membrane itself, but permits of the passage into the blood-stream of micro-organisms from the bowel.

(*f*) It is to be emphasised that the pathological changes found in the gastro-intestinal tract are more marked in some individuals than in others; and that, while all of them may occur in one and the same subject, it is usual to find considerable variation in the incidence of particular lesions in different individuals.

To proceed with our investigation of the relation of faulty food to the common gastro-intestinal disorders of the present day. It is usually accepted as a proof of the causation of a malady that if an investigator by one agency or another can produce in animals, under controlled experimental conditions, the malady in question then this agency is the cause of the disease, or intimately associated with its causation. Consider, then, that by means of faulty food (1) diarrhœa, (2) dysentery, (3) dyspepsia and gastric dilatation, (4) gastric and duodenal ulcer, (5) intussusception, (6) colitis, and (7) failure of colonic function can be produced experimentally. I do not argue that they are invariably so produced, nor that faulty food is the only cause of them. I do not deny the influence of microbic or other pathogenic agents in contributing to their production; indeed, I have ever insisted upon it. But I do maintain that faulty food is often at the bottom of their causation, and that the use of natural or well-balanced food from birth onwards will greatly militate against their occurrence.

I cannot remember that by means other than faulty food such a disorder as colitis can be so readily produced, if at all; for the experimental production of amœbic dysentery by the oral administration of *Entamœba histolytica* cysts is not at all convincing. On the other hand, I have seen amœbic dysentery arise in deficiently fed wild monkeys, while others that were well fed escaped the disease, although subjected to the same risks of infection. In this instance malnutrition had enabled the specific organism to implant itself in the tissues of the bowel. If further evidence of the influence of faulty food in the production of these gastro-intestinal disorders be needed, it will be found in abundance in the medical history of the late war, during which these disorders were so often the consequence of faulty food. In this regard our enemies unwittingly served one useful purpose; they forced us to concentrate attention on the immediate and remote effects of food faults on the human body. But our ever-present enemies in peace—poverty, prejudice, ignorance, habit—are no less responsible in this regard; they, too, beneath the vaunted culture of our civilisation inflict upon numbers of our people an intolerable load of misery, which it is our duty to relieve.

I would, therefore, urge upon your attention a consideration of the effects of faulty food in relation to such acute disorders as infantile diarrhœa, jail dysentery, and asylum dysentery, asking you, while remembering the bacteriological aspects of these maladies, to look upon them also from the point of view of faulty food. The bacteriological path has led us far in our knowledge of preventable disease, but it will lead us further still if we traverse at the same time the paths of malnutrition that so often run parallel with it. In relation to such chronic disorders as "mucous disease" in children, chronic gastro-intestinal dyspepsia, pellagra sine pellagra, colonic disease in adults, cœliac disease, gastric and duodenal ulcer, chronic intestinal stasis, the food factor in their production deserves the fullest consideration. For, if the facts I have laid before you do not provide the whole explanation of their genesis, they are, I am convinced, intimately related to it. Time does not permit me to develop this theme further. Full reference has been made to it in another place.[2]

[1] At this point in the lecture a lantern-slide demonstration was given.

[2] McCarrison, R.: "Studies in Deficiency Disease," London, 1920.

PRESENT PREVALENT USE OF FAULTY FOOD.

Turning now to my last duty, that of presenting evidence that faulty food is largely used by many civilised people at the present day, I would ask you to consider first in this connexion the increasing tendency in modern times "to rear infants artificially—on boiled, pasteurised, and dried milks, and on proprietary foods, all vastly inferior to healthy mother's milk in substances essential to the well-being of the child—inferior not only in vitamins, but in enzymes, thyroid derivatives, and other essentials. When, as is sometimes the case, mother's milk is itself harmful to the child, is not this largely the result of her own disordered metabolism in many cases resulting from improper feeding before, during, and after pregnancy? For mother's milk, like the milk of animals, may be deficient in certain respects if her food be deficient. The milk of stall-fed cows is not so rich either in vitamin A or in vitamin C as that of cows fed in green pastures. Again, is not cow's milk—an important dietary constituent of young and old alike—gradually becoming a luxury reserved for the few? Vegetable margarines are replacing butter even among the richer classes. Fresh fruit, certainly in Great Britain, is a comparative rarity, even on the tables of the rich. Green vegetables are scanty, and such as there are are often cooked to the point of almost complete extraction of their vitamins and salts. White bread has largely replaced wholemeal bread, and it is notorious that bread forms a high proportion of the dietaries of persons of limited means. It is notable that, despite the food restrictions imposed upon the people of Belgium during the late war, the infant mortality and infantile diarrhœa decreased greatly—a circumstance which was due to the organised propaganda encouraging mothers to nurse their infants, and to the establishment of national canteens which provided prospective mothers from the fifth month of pregnancy onwards with eggs, meat, milk, and vegetables. Again, fresh eggs are so expensive as to debar the masses from their use. Meat is at best but poor in vitamins, and its value in these essentials is not enhanced by freezing and thawing. Sugar is consumed in quantities unheard of a century ago, and sugar is devoid of vitamins which the cane juice originally contained. The use of stale foods involving the introduction of factors incidental to oxidation and putrefaction is the rule, that of fresh foods the exception. Can it, then, truly be said that the variety of natural foodstuffs consumed by Europeans protects them from any deficiency of vitamins? My own clinical experience justifies no such belief; rather does it point in the contrary direction. Nor does it appear to be the experience of the compilers of the Thirty-Eighth Report of the British Medical Research Council, who write: "From a consideration of dietaries consumed by the poorer classes in the towns of this country (Great Britain) one is led to suggest that no inconsiderable proportion of the population is existing on a food-supply more or less deficient in fat-soluble factor"—deficient, that is to say, in a vitamin one of whose cardinal functions is to maintain the natural resistance of the subject against infections. That similar considerations apply in this country (United States of America) also appears from the experience of Osborne, who asserts that a large part of the food eaten by civilised people has been deprived of vitamin B by "improvements" in manufacture; and of Hess, who emphasises that latent and subacute forms of scurvy are common disorders of infancy due to insufficient intake of vitamin C. But the frequency with which deficient and ill-balanced foods are used is most apparent when the dietetic habits of persons in subnormal health are considered. It will surprise those who study them to find how many there are, of capricious appetite, who habitually make use of foods sometimes deficient in calories—for it is not the food presented to the subject that counts, but the food eaten and assimilated—and often dangerously deficient in one or more vitamins, in protein of good biological value, and disproportionately rich in starch or sugar or fats, or in all three. Infants fed on many of the proprietary foods in common use come within the category of the deficiently-fed, unless deficiencies are made good. The food of young children is commonly low in vitamin-content, and in suitable salts and protein, while it is frequently disproportionately rich in starch and sugar—a circumstance which enhances the danger of vitamin-deficiency. It may, indeed, be accepted as an axiom that the vitamin-value of a child's food is reduced in proportion to its excessive richness in carbohydrates. But the ranks of the deficiently-fed do not include only infants and young children; they include also those whose food is composed mainly of white bread, margarine, tea, sugar, and jam, with a minimum of meat, milk, eggs, and fresh vegetables. Even amongst those whose diet is more perfectly balanced, the commoner articles of food, as they are prepared for the table, are so low in vitamin-value that, unless they are enriched with a sufficiency of natural foods in the raw state, they are prone to cause ill-health, and especially gastro-intestinal ill-health. Such is my experience in India, where this European patient "cannot digest vegetables or fruit," and never touches them "as they carry infection," or that one "suffers so from indigestion" that he or she lives chiefly on custards and milk puddings; where milk is, of necessity, boiled and reboiled until as a carrier of vitamins it is almost useless; where meat is made tender by the simple device of boiling it first and roasting it afterwards; where every third or fourth European child has mucous disease, the direct outcome of bad feeding. So it is that the forms of food which such as these so commonly adopt are those most calculated to promote the very disorder from which they seek relief. Access to abundance of food does not necessarily protect from the effects of food deficiency, since a number of factors—prejudice, penury, ignorance, habit—often prevent the proper use and choice of health-giving foods. Who in the ranks of practising physicians is not familiar, among the well-to-do classes, with the spoilt child of pale, pasty complexion and unhealthy appetite, of sluggish bowel, and often with mucous stools or enuresis, who, deprived of the wholesome ingredients of a well-balanced natural food, craves for sweetmeats, chocolates, pastries, and other dainties as devoid of natural health-giving properties as their excessive use is common? Constantly one encounters the anxious mother of the "highly-strung" "nervous" child "of delicate digestion," whose ignorance of essential principles of feeding is only excelled by her desire to do what is best for her offspring; who, guided by the child's preferences, supplies the means to convert it into a static, constipated, unhealthy-skinned adolescent, equipped with digestive and endocrine systems wholly unfitted to sustain the continued exercise of healthy function. Or, again, who is not familiar with the overworked anæmic girl, static and with visceroptosis, acne or seborrhœa, and oftentimes with vague psychoses, who ekes out a paltry wage for teaching, sewing, or selling, satisfying the cravings of her tissues principally with white bread, margarine, and tea? Or with the languid lady, devoid of healthful occupation, who, living in the midst of plenty, deprives herself, for some imaginary reason, of substances essential to her well-being? Or with the harassed mother of children, oppressed with the constant struggle to make ends meet, stinting herself that others may not want, exhausted by childbearing and suckling, worry, and too little of the right food? What wonder that such a woman is dyspeptic, and that "every bite" she eats "turns on her stomach." Some there are, living in luxury, whom ignorance or fancy debars from choosing their food aright; others for whom poverty combines with ignorance to place an impassable barrier in the way of discriminating choice. It is for us so to instruct ourselves that we may instruct such as these, and use our newer knowledge to the end that customs and prejudices may be broken and a

more adequate dietary secured for those under our care.[3] We may, in our desire to promote the health, vigour, and fertility of our people, learn much from the practical farmer or stock-breeder whose experience has taught him that all these evidences of normal functional activity of the animal organism are dependent in the main on one great factor—perfect food-supply.

CONCLUSION.

I have said enough to serve as an introduction to the study of this important subject, than which there is none more worthy of the consideration of those whose life is spent, or to be spent, in guarding the national health. It seems to me that in regard to it we have three obvious duties: the first to instruct the masses as to what to eat and why to eat it; the second to apply the results of our science to the production of natural foods in abundance and to their widespread and cheap distribution rather than to the erection of institutions for the treatment of maladies due to their want; the third, and most important, ardently to pursue our investigations and the acquirement of knowledge. In no department of human endeavour are the words from the agrapha of Christ more pertinent than in their application to the study of the relations of food to health and disease:—

"Let not him who seeketh, cease from seeking until
he hath found;
And when he hath found he shall wonder."

EXPERIMENTS UPON IMMUNITY TO TUMOUR GROWTH.

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THE transmission of cancer from one animal to another was first recorded by Hanau in 1889,[1] later by Morau (1894)[2] and others. Since the publication of Jensen's paper in 1903,[3] and the general recognition that transplanted tumours are derived from living malignant cells, the subject of transmitted cancer has attracted investigators in many parts of the world, and special attention has been devoted to the particular branch of the cancer problem which concerns the production of immunity to tumour growth.

It has been shown by Bashford, Murray, Cramer, Russell[4] and others that a state of resistance can be acquired in animals after they have been inoculated with tumour material, and much work has been done to try to elucidate the nature of this reaction in the hope of finding some method of practical value in the treatment of cancer. Numerous attempts have been made to produce immunity in cases of malignant disease, some of the earliest being those of Hericourt and Richet in 1895.[5] Many of these were made before general attention was drawn to the subject of transmitted cancer, for the most part on the assumption that malignant tumours were due to some living agent, and that immunity could perhaps be produced by methods analogous to those used in combating bacterial infection.

Various Attempts to Produce Immunity.

The recognition that immunity to transplanted cancer can sometimes be produced by the inoculation of tumour tissue led to renewed efforts to find some method of treatment which would protect human beings with malignant disease from the growth of their own tumour cells. There were obvious reasons for not using living tumour tissue, for it had been repeatedly shown that inoculations of this kind in spontaneously affected animals almost invariably produced tumours. In 1908 Bashford, Murray, and Cramer[6] showed that the injection of blood corpuscles into mice protected these animals against subsequent inoculations with carcinoma, and for a time the possibility of using normal tissues as a means of treatment attracted many workers. From the papers published during the following years it is now known that all tissues, especially those rich in cells, produce a limited degree of resistance to tumour growth when inoculated into animals of the same breed. This has however no practical value, for the immunity obtained does not last. It reaches its maximum in 10 to 14 days and then gradually disappears. The protection is not increased by repeating the dose, nor does a larger dose intensify the effect.[6] Moreover, this immunity neither prevents the growth of autologous grafts in animals with spontaneous malignant disease, nor affects the growth of an established tumour. Under these circumstances it is not surprising that Delbet and his colleagues,[7] following the lines of Schöne's original work with animals,[8] were not successful in treating malignant disease by injecting emulsions of fœtal and animal tissues.

Delbet,[7] Coca and Gilman,[9] Fischera,[10] Weinberg,[11] Bosch,[12] and others have endeavoured to produce active immunity in man against malignant disease with extracts or emulsions of the patients' own tumours. Delbet,[7] also Coca and Gilman[9] have recorded that in some cases tumours formed at the site of injection. Autolysed extracts or emulsions of the growth were often used, the latter as a rule having some preservative added such as toluol, chloroform, or phenol. Bullock and Rohdenburg,[13] working with Flexner Jobling carcinoma of the rat, excised tumours from 67 animals and replaced them in the shoulder region. Eleven days later the animals received a test inoculation. Although large amounts of degenerate and autolysed tumour were absorbed, no immunity was produced. Carl Lewin[14] treated rats with autolysed extracts of tumour tissue and obtained no protection. Blumenthal[15] has also done work on similar lines. In 1905 Bowen[16] studied the effect of obliteration of the blood-supply upon tumours in mice, and although with this treatment the tumours necrosed and disappeared, he was unable to influence tumours growing in other parts of the same animals.

All these results bear out the well-known clinical fact, that in spite of extensive autolytic changes and necrosis in malignant growths there is, as a rule, rapid advance of the disease and ultimately formation of metastases. It has been shown experimentally that if tumour tissue is mechanically disintegrated it loses its power to confer protection. This work of Haaland[17] has been repeatedly confirmed, and has led to the opinion being very generally expressed that immunity to tumour growth can only be produced after the absorption of living cells.

Immunising Tissue Treated with X Rays.

In 1910 Contamin[18] recorded that he had obtained a condition of immunity in tumour-bearing mice after he had treated the growths with X rays. He also states that if he inoculated mice with tumour material which he had exposed to X rays in vitro, the animals developed immunity to a subsequent inoculation of living tumour, but that excessive radiation of the immunising tissue spoilt its properties. This work was extended by Wedd, Morson, and Russ,[19] using Twort carcinoma. They showed that mouse carcinoma, if it had been exposed to a sufficient dose of radiation from radium, failed to grow when inoculated into normal mice. Some weeks later the mice were given an inoculation of non-irradiated tumour, and most of the animals were found to be immune. The degree of this immunity depended upon the amount of radiation to which the tumour tissue had been exposed, and the authors plotted a curve showing the reduction in value of the immunising material with increasing doses of radiation. During the last few years we have repeatedly noticed that animals which have absorbed irradiated tumour tissue

[3] Quoted from the author's "Studies in Deficiency Disease," p. 7.
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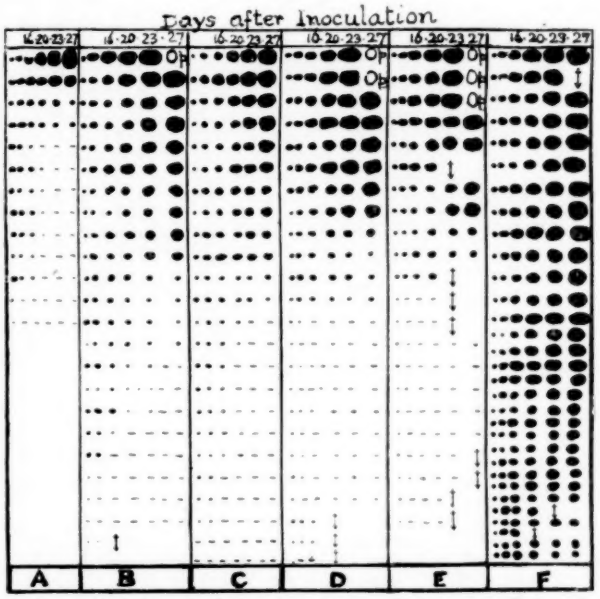
are immune to subsequent inoculations. The immune state produced in this way is of much greater intensity than that caused by the inoculation of normal tissues; the animals are apparently permanently protected, for test inoculations after long intervals have been unsuccessful. The immune condition is acquired when the irradiated tumour cells have never formed a tumour, and this can be assured by an adequate dose of radiation. At the present time we have no definite knowledge of the nature of the bodies liberated from irradiated tumour tissue after inoculation which are responsible for the production of the immune state; there is no doubt, however, that a series of very complex changes takes place in it.

Experiments have been undertaken during the last two years to obtain more information with a view to using irradiated tumour for the treatment of human cancer, and this paper gives the results obtained.

1. *Technique.*

A rat bearing a tumour is given an anæsthetic and the growth is removed with aseptic precautions. It is cut into pieces, minced with a Haaland mincer into a Petri dish, and covered with a sterile sheet of mica. The dish is placed 30 cms. below the anticathode of a Coolidge tube running at an alternative spark-gap of 5 cms. between spheres, 5 cms. in diameter, the time of exposure depending upon the output of the bulb. This is checked every minute by the readings of an electroscope. As yet there is no international unit by which X rays are measured, and during the course of this work we have employed the "rad" as our working unit — i.e., the minimum dose of X rays which, under these conditions, is needed to prevent the growth of Jensen's rat sarcoma when inoculated into normal rats. After standardising the electroscope with a known quantity of radium, the length of exposure to the X rays necessary for giving a rad is determined as the exposure goes on. The irradiated material is then inoculated into rats. The control and experimental animals are of equal weight and of the same breed, and share the same cages.

FIG. 1.



A, Immunised 8 weeks before inoculation. B, 6 weeks. C, 4 weeks. D, 2 weeks. E, 1 week. F, Controls. Op, Operation, tumour removed. Arrows indicate "died."

2. *Quantity of Tissue Inoculated.*

A considerable degree of immunity has often followed the inoculation of quite small pieces of irradiated tumour. In order to find how the degree of immunity varied with the amount of material, 80 rats were given quantities of irradiated Jensen's rat sarcoma ranging from 0·003 to 0·2 c.cm. Fourteen days later all these animals and the controls received a test inoculation. The degree of immunity did not vary much; the best result was obtained with the largest quantity, and in subsequent tests 0·2 c.cm. was used.

3. *Time-Factor in the Production of Immunity.*

Experiments were made to determine the rapidity with which immunity is produced. Batches of rats were given 0·2 c.cm. of irradiated Jensen's rat sarcoma at various intervals. The time between the immunising dose and the test inoculation was 8, 6, 4, 2, or 1 week. This, of course, made it necessary to use different tumours for the immunising doses, but it was then possible for the whole series and the controls to have their test inoculations on the same day from the same tumour. The results are given in Fig. 1.

Each batch of rats treated shows about the same degree of immunity, there is no marked difference between them. The eight weeks' series is perhaps a little more protected than the others, but in it there are fewer animals, owing to deaths. It appears from this result that the maximum effect is reached fairly rapidly, as in other immunity reactions, and is lasting, for these animals were still immune some months later.

4. *Influence of the Strain of Tumour on the Production of Immunity.*

The production of immunity after the absorption of irradiated tumour has been shown to occur with four different strains of malignant growths. The first work of this kind by Contamin [18] was done with a glandular carcinoma of the mouse: this was afterwards confirmed by Wedd, Morson, and Russ for Twort carcinoma.[19] The experimental work described in this paper has largely been done with Jensen's rat sarcoma, a tumour which gives nearly 100 per cent. of successful inoculations and grows very rapidly. To see whether similar results could be obtained from a different type of growth a series of experiments was made with a very slowly growing sarcoma, F 16 of the Imperial Cancer Research Fund.

A batch of 22 rats was treated with 0·003 gm. of irradiated tumour and a month later received a test inoculation. The results are shown in Fig. 2. It will be seen that notwithstanding the small amount of the immunising dose a high degree of protection was obtained.

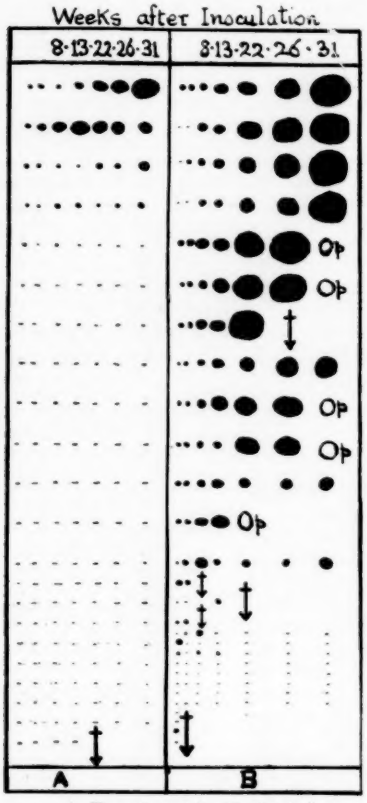
5. *Established Tumours.*

It has been insisted upon by various writers that it is comparatively easy to immunise an animal against the implantation of a graft, but difficult to affect an established tumour; in fact, up till now no immunising method has been found which will influence the growth of an established tumour. The only immunity known to affect a growing tumour is the concomitant immunity sometimes acquired by animals after they have been inoculated with living tumour cells.

Experiments were undertaken to determine whether the immunity produced by the absorption of irradiated tumour would have any effect on an established growth. For this purpose two methods were used: (*a*) Animals bearing single tumours were treated with tumour tissue which had been exposed, outside the body, to a lethal dose of radiation. (*b*) Animals with two growing tumours were treated by exposing one tumour to a lethal dose of radiation; the growth of the untreated tumour in the same animal was recorded.

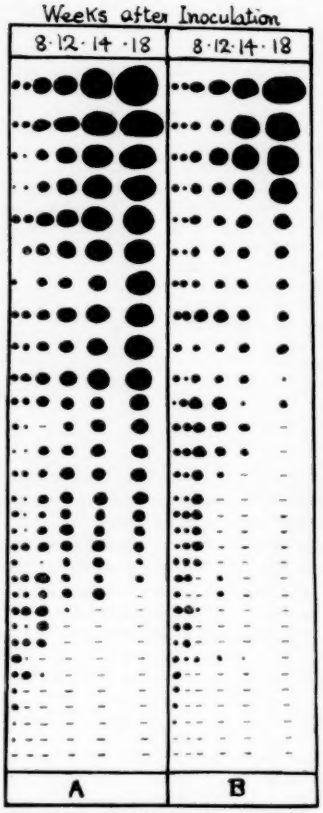
Experiments: Method A.—One hundred and ten animals were inoculated with living tumour cells of

FIG. 2.



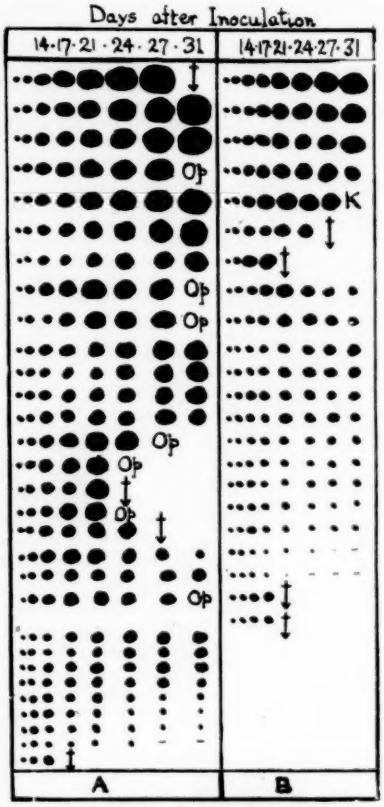
A, Experimental. B, Controls.

FIG. 4.



A, Controls. B, Immunising injection at eighth week.

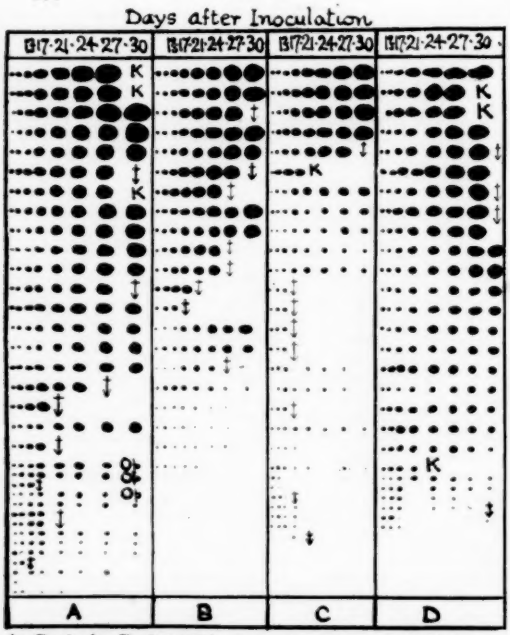
FIG. 5.



A, Controls. B, Experimental.

Note.—The linear dimensions of the original graphs are reduced in the following ratios:—Fig. 1, 1/12; Fig. 2, 1/7; Fig. 3, 1/14; Fig. 4, 1/8; Figs. 5 and 7, 1/9; Figs. 6 and 8, 1/11.

FIG. 3.



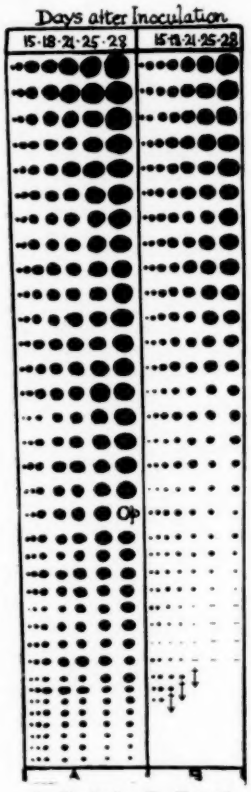
A, Controls. B, Immunised at same time as test inoculation. C, Immunised 3 days, and D, 13 days after test inoculation. K, Killed.

Jensen's rat sarcoma, and at various intervals afterwards received an immunising injection. The results are shown in Fig. 3. It will be seen that the effects are much less apparent than when the immunising dose is given *before* the test inoculation (vide Fig. 1). The best result is in column C, immunised three days after inoculation. Column D shows only a very slight effect; the tumours are only a little smaller than the controls.

These experiments refer to a tumour which grows very rapidly and doubles its volume in about four days. The rapidity of growth makes it difficult to decide whether the immunising dose has much effect, for there is so little time before the tumours must be removed or the animals killed. The experiments were therefore repeated with the slowly growing sarcoma, F 16. This tumour grows at about a sixth of the rate of Jensen's tumour. A batch of 64 animals was inoculated with this sarcoma; eight weeks later they were divided into two groups, the tumours of one batch being as far as possible the same size as those of the other. An immunising dose of 0·2 c.cm. of irradiated slow sarcoma was then given to one group, the other serving as controls. The results are shown in Fig. 4. There appears to be a definite effect on the established tumour, for after the immunising dose the tumour has grown progressively in only five animals.

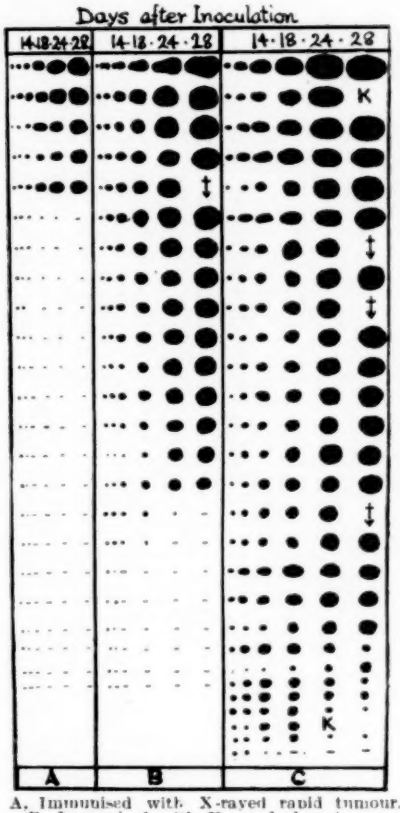
Experiments: Method B.—In these experiments 26 normal rats were given inoculations of Jensen's rat sarcoma into each axilla, controls being inoculated at the same time in the left axilla only. Five days later the nodules on the right sides of the animals, which were then palpable, were exposed to a lethal dose of beta and gamma radiation from a radium capsule; the tumours on the other sides received a

FIG. 6.



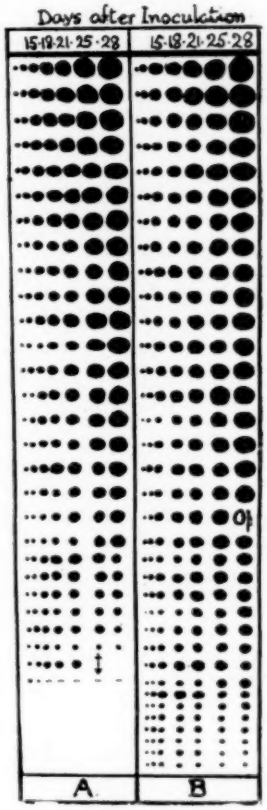
A, Control. B, Experimental.

FIG. 7.



A, Immunised with X-rayed rapid tumour. B, Immunised with X-rayed slow tumour. C, Control.

FIG. 8.



A, Experimental. B, Control.

negligible fraction of the total radiation. The treated tumours disappeared. Those in the opposite axillæ were measured at frequent intervals and compared with the control tumours. The results are given in Fig. 5 and Table I.

TABLE I.—(Numerical data of FIG. 5.)

Tables I., II., and III. give the average volume of tumours in experimental rats (B), compared with controls (A). The figures at the head of the tables show the number of days after inoculation.

Ratio.	6	10	14	17	21	24	27	30
$\frac{B}{A}$	1·2	0·90	0·66	0·50	0·42	0·38	0·30	0·28

TABLE II.—(Numerical data of FIG. 6.)

Ratio.	7	11	15	18	21	25	28
$\frac{B}{A}$	0·90	0·63	0·42	0·39	0·39	0·38	0·35

TABLE III.—(Numerical data of FIG. 8.)

Ratio.	7	11	15	18	21	25	28
$\frac{A}{B}$	0·98	0·98	0·89	0·89	1·0	0·94	1·1

It will be seen that the average volume of the tumours in the treated animals is less than half that of the control tumours. This experiment has been repeated; the results, given in Fig. 6 and Table II., are practically identical, showing that the immunity produced by the absorption of irradiated tumour tissue does affect an established tumour. The average volume of the tumours in the treated rats is again less than half the volume of those in the controls.

6. *Influence of the Condition of the Tumour on its Power to Confer Immunity.*

The tissue of a recurrent or a rapidly progressive Jensen's rat sarcoma is usually very vascular, semi-transparent, and of fairly uniform consistency; on the other hand, a disappearing tumour may have the whole centre of the mass necrotic, usually it is solid, but pale and anæmic, and close examination shows a fine mottling of necrosis throughout its structure. In order to find out if there would be any difference in the degree of immunity conferred by the varying condition of the tumour used for the immunising dose, minced tumour from a rapidly growing recurrent Jensen's sarcoma was X rayed simultaneously with tumours which had stopped growing but were not obviously necrotic. Two batches of 23 rats were inoculated, one with the rapidly growing and the other with the slowly growing tumour, each animal being given 0·2 c.cm.; 11 days later they were given a test inoculation at the same time as 28 controls. The results are given in Fig. 7, and show that the rapidly growing tumour had much the greater effect; in fact, this series has given the highest degree of immunity we have yet obtained; only five rats out of 30 grew tumours, and these were smaller than the majority of the controls.

7. *Effect of the Dose of Radiation on Production of Immunity.*

It was shown by Contamin and confirmed by Wedd, Morson, and Russ, in the papers already mentioned, that the production of immunity after the absorption of irradiated tumour tissue depended upon the dose

of radiation, and that if the latter were excessive the immunising power of the material was destroyed.

Experiments were undertaken to determine the effect of *reducing* the dose of radiation below the amount necessary to kill the growth cells. Twenty-eight normal rats were given inoculations of Jensen's rat sarcoma into each axilla, 35 control animals being inoculated at the same time in the left axilla only. Five days later, when the tumours were palpable, those on the right sides were exposed to the radium capsule for a time corresponding to a dose of ¼ rad. Four weeks later the volumes of the irradiated tumours, not depicted here, were much smaller than the controls, but the untreated tumours on the opposite sides of these animals were quite as large as the controls. Vide Fig. 8 and data in Table III. This result is quite different from the effect obtained when the tumours received the lethal dose of radiation, vide Figs. 5 and 6.

8. *Other Experiments.*

In view of the experimental results recorded in the previous sections and the possibility of using this method for the treatment of patients, experiments were undertaken to facilitate the technique. Attempts were made to extract an active principle from irradiated Jensen's sarcoma using Locke's fluid, normal saline, or normal rat's serum as the extraction fluid. All these efforts have failed. In one series the tumour tissue was exposed to a lethal dose of radiation: an equal volume of normal saline was added, and then ground with well-washed quartz sand. The emulsion was kept sterile at room temperature overnight, and then 0·5 c.cm. was inoculated into 12 rats; a fortnight later they received a test inoculation. The tumours in these animals were larger than those in the controls. The mechanical disintegration and addition of saline completely destroyed the immunising properties, probably because this treatment had hastened autolytic changes.

Malignant tumours are so often infected with bacteria that it would obviously be a great advantage in this work if some antiseptic could be added to the X-rayed material, provided this could be done without spoiling its immunising properties. The dose of radiation used has practically no bactericidal action. Flavine was chosen as the antiseptic least likely to alter the proteid composition of the tissue. Irradiated Jensen's sarcoma was mixed with an equal volume of a solution of flavine, 1 in 1000, in normal saline; this was allowed to stand at room temperature overnight, and then 0·5 c.cm. of the tumour emulsion was inoculated into 24 rats. This experiment cannot be considered conclusive, as the number of animals used was small, but the results indicate that the flavine was injurious to the immunising power of the material.

Experiments were also made to test the effect of drying the irradiated sarcoma. The tissue was minced and exposed to a lethal dose of radiation, and part of it was then rapidly dried in vacuo (in about two hours) at room temperature; 10 rats (Group A) were inoculated with this, others (Group B) received the same amount of undried material. The results given in Table IV. show that the immunising properties were injured by drying.

TABLE IV.

Days after inoculation..		8	11	14	17	21	24
Average volume in c.cm.	Group A ..	0·25	0·80	2·4	5·6	10·6	15·3
	Group B ..	0·03	0·07	0·10	0·27	0·50	0·58

Results of this kind were perhaps to be anticipated in view of the many unsuccessful attempts which have been made to treat malignant disease with extracts of cancer material, and in view of the generally accepted opinion that immunity can only be produced by living cells. The general impression conveyed is that the active agent causing immunity is produced from tumour cells during the process of death after irradiation, and that any treatment which causes the immediate destruction of the cell prevents the production of this active body.

Conclusion.

The experimental results in this paper confirm and extend previous work upon the immunity in animals to tumour growth, which can be set up by irradiated tumour cells. If the processes controlling the growth of tumours in animals have an analogy in man, then our observations appear to have two bearings upon the treatment of malignant disease. The first is that some degree of immunity may result from the adequate irradiation of a malignant tumour in the body, but to ensure this in practice is generally a matter of great technical difficulty. The second is that the treatment of a patient with irradiated tumour cells, after the surgical removal of the growth, may help to set up a state of resistance to the disease. This question is considered in the following paper.

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MATERNITY CONDITIONS IN INDIA.—The Government of India, in accordance with an undertaking given at the Washington Labour Conference in 1919, has lately been considering the question of the maternity conditions of women industrial workers in India. The Countess of Dufferin's Fund has now lent to Government the services of two officers from the Women's Medical Service. One of these, Mrs. Dissent Barnes, M.D., has been attached to the Government of Bombay, the other, Miss Dagmar Curjel, M.D., D.P.H., to the Government of Bengal for the purpose of making a careful inquiry into the maternity conditions of women workers, and hearing recommendations for the improval of these conditions. Miss Agnes Scott, M.B., is making a similar inquiry in the Punjab. The Council of the Countess of Dufferin's Fund took this step believing that schemes so organised for groups of women employed in factories will lead to more general adoption of measures of similar relief for other classes of women in India.

AN ATTEMPT TO PROCURE IMMUNITY TO MALIGNANT DISEASE IN MAN.

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AND
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IN the previous paper it has been recorded that immunity to transplanted malignant disease can be produced in animals by inoculating them with tumour tissue which has been exposed to a suitable dose of radiation, and that this can be done without risk of a tumour forming at the site of injection. This experimental work has only been done for transplanted malignant growths in animals and we cannot say that the results in spontaneous cancer will be the same; but with these results before us it seemed clearly worth while to test the process in the human body.

Since May 1920, we have been attempting to immunise patients suffering from cancer against their own tumour cells. The number of cases treated (30 in all) is too small, and the time that has elapsed too short, for us to be in a position to form an opinion of much value of the effect on the progress of the disease; the cases will have to be watched for a considerable time. All that we can say at present is that, with efficient technical precautions, the treatment can be carried out without causing tumour formation or serious effects. Some years must elapse before the real value of a new treatment for malignant disease can be determined, and it has therefore seemed to us desirable to describe this method and record the results so far obtained. For this preliminary work, the cases treated were those in which the disease was at such a stage that complete surgical removal was not considered possible, but not so far advanced as to preclude a prospect of life for some months.

The Technique.

At the operation only as much tumour need be removed to provide sufficient material for the subsequent injection. It often happens in breast cases that total removal of the breast is more simple than partial removal. In cases where glands have been involved no attempt has been made to remove all the growth: the tumour, or as much of it as is needed, having been removed, the wound is closed and dressed. Two pockets are then prepared in the abdominal wall, on either side of the mid-line, in the following manner. An incision about an inch long is made down to the deep fascia, and a strong pair of sinus forceps thrust along between the subcutaneous tissues and muscles and then opened out. The pockets thus formed are fan-shaped with the narrow end upwards so that injected material tends to be retained; they are purposely made large in order to increase the area of contact between the patient's tissues and the injected material. If this precaution is not taken it has been found that much of the tissue undergoes autolysis and is afterwards discharged; this may happen even when the injection mass remains sterile. A large-sized drainage-tube is put into each of the openings, reaching nearly to the bottom of the pocket, and stitches are inserted into the skin so that the wounds can be easily closed afterwards.

The whole of the growth removed at the operation is sent to the laboratory in a sterile dish. The specimen is cut up with scissors and the growth separated as far as possible from the normal tissues. It is put into a metal mincing-machine, covered with a sterile towel, minced into the middle of a shallow dish, and spread into a layer of uniform thickness. The rim of the dish having been smeared with sterile vaseline, it is covered with a sheet of mica, put into a slightly larger and deeper dish, and wrapped in a sterile towel to protect the material from possible contamination during the X ray exposure.

After a radiation dose of 2 rads the minced tumour is sucked into an all-glass syringe, fitted with a wide aperture and cannula, which is returned to the ward; the preparation of the material as a rule takes about two hours. In the ward, the dressings are removed from the abdominal wounds, and equal quantities of the irradiated material injected through each drainage-tube; these are then withdrawn, the ligatures tied, and the wounds sealed with gauze and collodion. If the operation has been at all lengthy this can often be done before the patient has completely recovered consciousness, but in any case the proceeding has been found to be almost painless. The quantity of material injected has varied from 4 to 15 c.cms., and in most cases has been more than 8 c.cms. The injection is done as soon as possible after the operation, in order to avoid changes in the material, and no saline is added.

X Ray Technique.

It was necessary to remember that in introducing this material into patients we were inserting tumour cells into the most susceptible of all individuals, and that we were trusting entirely to the radiation to prevent these cells growing. The method of treating the minced growth has followed the lines of the experimental method described in the previous paper, the unit of radiation used being the dose required to kill malignant cells in vitro. As a safeguard, this dose has been doubled. Reference to the work of Wedd, Morson, and Russ[1] shows that an increase in the dose of radiation to this extent only reduces the immunising value of the material by 15 per cent. but that further radiation reduces it more, and eventually destroys it altogether. We feel it is essential in a treatment of this kind that a rigorous X ray technique be adopted. The readings of electrical instruments in the high or low-tension circuits cannot be relied upon to give a correct measure of the dose of radiation. These instruments have their uses, but they do not measure the radiation as it is being delivered, and so do not lead to a correct valuation of the dose.

The method we have adopted is to run the Coolidge tube as far as possible under the same conditions of spark-gap and heating filament current. Directly the exposure of the minced tumour has begun, measurements of the X rays issuing from the bulb are taken by means of a gold-leaf electroscope which has previously been calibrated by means of a known quantity of radium. The rate of fall of the leaf is proportional to the yield of X rays from the bulb, and as readings of the electroscope are made at least every minute during the exposure, which generally takes about an hour, it will be seen that a valuable check is made upon the dose of radiation. The readings are totalled as the measurements are made; any fluctuations in the output are thus detected, and the time of exposure correspondingly prolonged or shortened.

The tumour is removed and irradiated outside the body instead of being exposed to radiation whilst still in the patient; because if tumour tissue is exposed to less than the lethal dose of radiation no immunity is obtained, as was shown in the preceding paper. In the report[2] issued from these laboratories, and now in course of publication, on the use of a large quantity of radium—viz., the gamma radiation from about 5 gms. of radium bromide, it is shown that with one application it is difficult to apply a lethal dose to tumour cells in the body even with this penetrating type of radiation. The reason for this is that the requisite dose is larger than that which causes vesication of the skin, and although temporary benefit has repeatedly followed the application of less than the lethal dose to breast carcinomata, recurrence has been observed, even in those cases in which the skin has been severely damaged.

It is entirely owing to this difficulty of giving tumour cells in the body an adequate dose of radiation that the method described has been used; it has the great

advantage that outside the body the growth cells can be given an almost uniform dose which can be as large as is necessary.

Evidence of Immunity.

The final result which it is hoped to obtain by this method is that the patient will be able to destroy all tumour cells left in the body after a limited operation. We must, however, be prepared to find that the immunity will vary in intensity, particularly as the nature of the body causing the immunity is unknown and we are not in a position to standardise the agent. The experimental evidence of immunity most easily obtained is the failure of a tumour graft which would grow readily in normal animals. This test gives little information about the degree of immunity, for a graft may fail to grow in an animal which has been treated with an emulsion of normal tissues; the protection in this case is only of a temporary character and is not able to affect the growth of an established tumour; but, on the other hand, a graft will not grow in an animal which has previously absorbed a tumour; and this protection is lasting and strong enough to have destroyed the original growth. The failure of a graft to grow would perhaps be comparable with the failure of a metastatic nodule to become established, so that in human cases, we might expect that the prevention of metastases would be the first evidence of the patient acquiring some degree of immunity. This must, however, be accepted with reserve, for there is at present no definite evidence to show that a metastatic deposit is more easily destroyed than cells around a primary growth.

It has been shown by Mottram and Russ[3] that it is possible to recognise in animals the existence of a state of immunity by taking measurements of the size of the tumours at regular intervals, for, provided other conditions are constant, the rate at which a tumour grows depends upon this immunity. The production of immunity is indicated by a reduced rate of growth, and later by its cessation, and only when the protection is well established does the growth begin to disappear. If similar effects can be obtained in man, successful treatment will be shown by a delay in the progress of the disease, and we can hardly expect to influence large established growths in a short time. Variations in the rate of growth in human cancer are so common under ordinary conditions that great care must be taken before such changes can be attributed to treatment.

As far as we know at present the addition of antiseptics to the irradiated material weakens its immunising properties; there is also some indication that the tumour tissue is of no value if infected with septic organisms sufficient to cause an abscess to form at the site of injection. The dose of radiation given to the material has practically no bactericidal action. For this reason many cases otherwise suitable for the treatment, such as growths in the tongue and rectum, have had to be refused, and cases have been chosen in which the growth could be obtained from a situation where there was neither ulceration of the skin nor exposure to a septic mucous surface. In two cases abscesses have formed although the ulcerated part was excluded from the injection mass; this also happened in two other cases and in all four the disease continued to progress. The local condition rapidly recovered when the contents of the abscesses were evacuated.

Cases Treated.

Details of 12 patients treated before July, 1921, are appended.

CASE 1.—A. G., female, aged 43, was admitted to hospital in March, 1920, for a large inoperable carcinoma of the left breast of one year's duration. Nine tubes of radium were inserted (436 mg.). In June the growth was movable but slightly ulcerated. It was removed locally; the tissues were minced and exposed to radiation and 10 c.cm. were then inserted into a pocket in the abdominal wall. This was retained for a week but then discharged septic. In this case it was known from the specimen removed that growth cells must have been left behind on the chest wall. For six months there was no recurrence, then nodules of growth began to appear and grew very slowly. Before the operation patient had complained of shortness of breath, this gradually got worse and she died in October, 1921.

CASE 2.—E. R., male, aged 57, was admitted suffering from a large sarcoma of the neck, first noticed in June, 1919. An operation had been done in December for removal of the growth, which recurred in March, 1920. On admission there was a large projecting mass on the left side of the neck extending from the margin of the jaw to the clavicle. The skin was red, but not ulcerated. In June, 1920, part of the growth was removed; it was minced and exposed to radiation and 8 c.cms. were then inserted into a pocket in the abdominal wall. This tissue was completely absorbed. The primary growth continued to progress slowly, the skin ulcerated, and hæmorrhages from the wound began to occur. The patient died in October, 1920; no post-mortem examination was held.

CASE 3.—A. T., male, aged 29, had a sarcoma of the right testis removed in July, 1918, and in September a laparotomy was performed for a swelling in the abdomen. He was found to have a localised mass of growth in the mesentery; this was considered inoperable, and the abdomen was closed. In December, 1920, laparotomy was again performed, and the growth, which was now the size of a cricket-ball, incised. The contents, consisting of hæmorrhagic soft tissue, were scraped out and irradiated, and 10 c.cm. returned into a pocket prepared for it in the abdominal wall; it was completely absorbed. Microscopic examination showed the growth to be a very cellular round-celled sarcoma. In January, 1921, two tubes of radium, 120 mgs., were put into the growth cavity for 14 hours. The patient remained in good health until July, 1921, when he complained of pain in the region of the stomach, and a swelling began to form. In October the abdomen was opened and a mass was found to have reformed of about the same size as before. The centre of the growth was necrotic and bloodless, the periphery being soft and very vascular. The contents were again scraped out and tissue from the vascular part irradiated: and 15 c.cms. reinserted into a pocket in the abdominal wall being well absorbed. The patient did well after operation, improved slightly in general health, and returned to his home.

CASE 4.—E. B., female, aged 56, attended the hospital in June, 1920, with a large inoperable medullary carcinoma of the left breast. In July she was treated by exposure to the gamma rays from 5 g. of radium bromide. As a result the growth was reduced in size and became more movable. In November, 1920, she was admitted, the growth then being fixed to the chest wall and the skin much involved; there were hard fixed glands in the left axilla and supra-clavicular triangles. The growth was excised locally, the tissue minced, irradiated, and 8 c.cms. inserted into a pocket in the abdominal wall. This material became septic and an abscess had to be opened. The growth continued to progress and multiple recurrences were found on the chest wall in December; patient died in July, 1921.

CASE 5.—M. G., female, aged 66, first noticed a lump in the left breast in October, 1920. In November she was admitted to the hospital; the breast was elevated, the nipple much retracted, and a hard mass was to be felt in the upper and outer quadrant. The skin was not ulcerated. The patient was very obese and no enlarged glands could be detected. In November the left breast was removed, the pectoral muscles being left and the axillary glands not touched. The specimen contained a mass of carcinoma measuring about 5 by 4 cms. and was microscopically a spheroidal-celled carcinoma. The growth was minced, and after irradiation 10 c.cms. were returned into an abdominal pocket. The material was retained and absorbed. In January, 1922, this patient was in good health and no recurrence could be detected.

CASE 6.—S. H., female, aged 53, had the left breast removed for malignant disease in June, 1920. The growth recurred in August in the operation area; patient was admitted in January, 1921, with extensive recurrence on the chest wall, also in the left axilla and supra-clavicular triangle. In January two nodules of recurrence were removed, the growth tissue was minced, and after it had been exposed to radiation, 12 c.cms. were inserted into two abdominal pockets. This was entirely absorbed. Patient complained of slight cough at the time of this operation, but no signs of visceral growth were detected. The cough increased, and in March, 1921, signs of secondary involvement in the lungs were evident. She died in April, 1921, with the multiple visceral metastases. The site of the injected material could hardly be detected at the post-mortem examination.

CASE 7.—E. L., female, aged 63, in November, 1920, a lump was noticed in the right breast; she was admitted to hospital in January, 1921, with a hard mass in the lower and outer quadrant, the skin being adherent and slightly red but not ulcerated; the mass was not adherent to the pectoral fascia. The axillary glands were enlarged. In January, 1921, the breast was removed by a local operation, the pectoral

muscle being left, and the axilla not touched. 10 c.cms. of minced growth, after irradiation, were inserted into two pockets in the abdominal wall. This was completely absorbed. On microscopic examination this growth was a spheroidal-celled carcinoma. In January, 1922, this patient was in good health and no recurrence could be detected.

CASE 8.—L. E., female, aged 58, noticed a lump in her left breast in June, 1920, and was admitted into hospital in January, 1921, with a tumour in the lower and outer quadrant of the breast. It was adherent to the skin but not to the pectoral fascia. There were numerous hard enlarged glands in the left axilla, but none to be detected in the supra-clavicular triangle. In January, 1921, the breast and axillary glands were removed together with part of the pectoral muscle, the glands were found to be extensively involved. The tumour tissue was minced and exposed to radiation, and 8 c.cms. returned into a pocket in the abdominal wall. This was retained for 11 days and remained sterile. On microscopic examination the growth was a spheroidal-celled carcinoma. In January, 1922, this patient was in good health and no recurrence was detectable.

CASE 9.—F. H., female, aged 58, had the right breast removed for carcinoma in July, 1918. The growth recurred in January, 1919; radium tubes were inserted and the growth was excised a week later. In October, 1920, it again recurred in the sub-clavicular glands, and patient was admitted to hospital with a large fixed mass below the right clavicle and much œdema of the arm. In February, 1921, part of this growth was removed, and five tubes of radium (268 mgs.) were inserted for 14 hours. The tumour tissue was exposed to radiation and then returned into a pocket in the abdominal wall. Both wounds became infected with streptococci. The growth has continued to progress slowly. In March more radium tubes were inserted (324 mgs. for 12 hours). Much fibrous tissue contraction has since occurred around the site of the growth, and has blocked the lymphatic supply of the right arm. Patient retains her general health, but suffers great pain from the œdema.

CASE 10.—E. C., female, aged 54, first noticed a lump on the front of her chest on the right side in March, 1919. She was admitted to hospital with a mass measuring 5 cms. by 3 cms. over the right third interchondral space. There was no ulceration, but the growth was slightly attached to the skin and deeper parts. There were small hard glands to be felt in the right axilla and supra-clavicular triangle. On March 11th, 1921, the growth was excised locally, the remainder of the breast and glands being left untouched. The tumour was exposed to radiation and 8 c.cms. inserted into two pockets in the abdominal wall; there was no temperature reaction and the material was retained. In July patient was given a course of X ray treatment to the site of the primary growth. On microscopic examination this was found to be a spheroidal-celled carcinoma. In January, 1922, this patient was in good health and no recurrence could be detected.

CASE 11.—R. C., female, aged 42, she first noticed discharge and bleeding from the right nipple in November, 1919; a lump was found in the breast in September, 1920, and slowly increased in size. She was admitted into hospital in May, 1921, with a hard diffuse mass in the upper and outer quadrant of the right breast, measuring 7 by 4 cms. The nipple was enlarged to twice its normal size; the skin was not ulcerated; enlarged glands could be felt in both axillæ. On May 10th, 1921, the breast and glands in the right axilla were removed, the pectoral muscle being left. The tumour was exposed to radiation and 12 c.cms. inserted into two pockets in the abdominal wall. There was no temperature reaction, and the material was retained for ten days. On microscopic examination this growth was found to be a duct carcinoma; the glands were not infected. In January, 1922, this patient was in good health and no recurrence could be detected.

CASE 12.—E. R., female, aged 39, in March, 1919, a swelling began to form in the right thigh. It was removed in June; in April, 1920, it recurred, and patient was admitted into hospital. In September nine radium tubes (436 mgs.) were inserted into the growth, and in October it was again removed. In June, 1921, patient was readmitted, the mass having grown much larger in the meanwhile. Tissues from the growth were removed, exposed to radiation, and 14 c.cms. re-inserted into two pockets in the abdominal wall. This was completely absorbed. On microscopic examination the growth was a round-celled sarcoma. The patient was then about seven months pregnant; she went to her home in the country nine weeks after operation. Cæsarean section was performed later, and patient was reported to have died in October, 1921.

Remarks.

It will be seen that in some of the cases the disease was very advanced, and that in two, there were probably visceral metastases at the time of treatment. There are five patients with carcinoma of the breast diagnosed by microscopic examination, and treated between November, 1920, and June, 1921. In all these a limited operation was performed, the primary growth only being removed and the axillary glands left, except in Case 11. When last seen (in January, 1922) these patients were all in good health, without evidence of recurrence.

In reviewing these results it must be borne in mind that in almost all the cases the stage of the disease rendered any other form of treatment inadvisable. In view of the results of some of the more recent cases it may be possible to improve upon them by adopting the treatment earlier, when dissemination of the disease has not yet occurred.

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THE X RAY DIAGNOSIS OF GASTRIC ULCER.[1]

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IT may be granted at once that the X ray method of examination is one, and only one, link in the chain of diagnosis, but it is often the all-important link which may be sufficient to give an absolutely positive diagnosis. The Americans always talk of an X ray laboratory, and this is correct, for it is a laboratory method that we use. The results of laboratory work depend on three factors—the personal, the equipment, and the routine method, all of which are essential if the reports from the laboratory are to be reliable.

The Human Factor.—Just as in clinical abdominal work, the larger the experience the fewer mistakes will there be. For the last 16 years we have been groping our way, and gradually the various schools of thought and practice, which have differed very widely, are coming together, and the most effective work I know is obtained by a combination of screen examination to which routine radiography is accessory. In nearly all cases the diagnosis is made from the screen and checked up by plates, but it is the experience of the man who does the screen work that makes the method effective, and particularly his knowledge and skill in palpation of the patient in the upright posture.

Apparatus.—This must be efficient—to attempt abdominal diagnosis with anything less than the best is fatal. The combination of the high-tension transformer and Coolidge tube is the best generating plant there is, but there is one drawback: although necessity makes us use the Coolidge tube we all fear it, for the problems of protection are not yet satisfactorily solved so far as the observer is concerned. The chief difficulty is that visualised palpation is essential for effective work, and, of necessity, the observer is directly in front of the tube, sheltered as far as possible by the diaphragm of the tube box, the patient's body, the lead glass of the fluorescent screen, and protective aprons. I have no use whatever for the perfectly protected screening stand that does not allow of free access to the abdomen, holding that, without palpation, only the obvious cases will be diagnosed.

I cannot refrain from one reference with regard to the X ray laboratory that is outside the scope of my present subject. Screening with palpation is trying both physically and mentally. The conditions under which this work is carried out in this country are often little short of criminal. Already there have been tragic accidents, and many of the workers are in

[1] A contribution to a discussion at the Section of Medicine of the Royal Society of Medicine on Jan. 24th, 1922.

dread of what may possibly happen, living under the shadow of they know not what. We know, however, that a great part of our risk lies in the inadequate, ill-ventilated rooms in which we have to work, and I would ask assistance in eliminating the dangers we know to exist.

Routine Methods.—These, and the results obtained, vary so greatly that it is essential to give a brief outline of the technique which I believe to be of the greatest all-round utility.

A Useful Technique.

The patient is prepared by having the bowels thoroughly cleared two days before the examination—the effect of the purgative must have passed off. No food is taken for at least three hours before the examination. The opaque food employed for outlining the stomach is a mixture of barium sulphate (3–4 oz.) in half a pint of milk, to which is added a little raspberry syrup and a teaspoonful of sodium bicarbonate. The object of the sodium bicarbonate is to obtain better filling of the duodenum. It was first employed by Carman on theoretical grounds, and I am convinced that by this addition we obtain a better filling of the pylorus and duodenum. It has a slight disadvantage, however: there is a useful, rough-and-ready way of testing the free acid in the contents by watching the increase of the air-space after a drink of a solution of this salt given later on, when the secretion has been going on for some time, and this method cannot be used when sodium bicarbonate has been given in the original mixture. Just before the opaque meal is given the patient eats a spoonful of toasted bread-crumbs—the object being to irritate any ulcer that may be present, and in this way to produce a spasm. The reason for this modification was the observation that so few hour-glass stomachs were seen after the liquid opaque meal as compared with the bread and milk food formerly employed. A half-pint of the opaque food is usually ample—more than this is apt to make palpation difficult, as the stomach is too full to comb out the rugæ by means of palpation. The present form of the liquid meal gives very satisfactory information as to the shape of the cavity, but it is of little value as a test of the motor functions of the stomach, and hence it is necessary to re-feed the patient with a real food test-meal. This is done five hours before he comes for the second day's examination, and the food employed is either barium sulphate or bismuth carbonate, mixed in bread and milk or porridge, according to the patient's choice. At this second examination the residue is examined, and the investigation of the cæcum and large intestine is carried out—the small intestine, of course, having been examined on the first day by periodic observations during the first two or three hours. Frequently, at the second examination, another liquid meal is given to confirm what one has seen in the stomach and duodenum on the first day.

The examination is conducted, for the most part, in the upright position, the couch being employed when one fails to obtain necessary information in the upright posture. The method is partly radioscopic, partly by means of plates taken from time to time, but in any examination I hold it absolutely essential that the observer must have free access to the abdomen and that he must undertake the most thorough and painstaking palpation, especially combing out the shadow of the food in the stomach. This should be done in such a manner that the rugæ are outlined; the observer should press the food up in front of his hands and manipulate it so that he finds any crypts in which the food lodges in an abnormal manner. Even more essential is the palpation of the pylorus and duodenum, often a difficult matter; this palpation is, in my opinion, the most essential and most valuable part of the opaque meal examination. Any method will show the obvious, but no method will show the fine detail that is necessary for the diagnosis of certain lesions that does not include a very careful visualised palpation. Many ulcers have been found by this means that must have been missed radiographically, no matter how many exposures were made. Frequently I have been unable to record a fleeting shadow on a plate, although I have had sufficient confidence in my vision to give a definite diagnosis that has been confirmed in the operating theatre.

Plates are taken from time to time as a record of the various examinations, but, from the diagnostic point of view, the plates are of no value whatever unless they show more perfect detail than can be made out on the screen. Really good plates sometimes show points that have been missed, and many a time a patient is brought back for further investigation in consequence. I do not, however, recollect a single case in which the final diagnosis has been made from the plates.

Serial Radiography.

A method still in vogue in the States in some places is what is termed serial radiography—the taking of a series of plates at different angles. In one clinic 60 plates of 10×8 are taken as a routine. Apart from the prohibitive cost, the same information is obtained by a satisfactory screen examination, which, in addition, gives extremely valuable information as to fixation, points of pain on deep pressure, and so forth. There is, however, one region in which a modified serial set of radiograms is of considerable value—i.e., the lower few inches of the lesser curvature and, to a lesser extent, the duodenum. This region is often difficult to visualise because of the vertebræ, and difficult to palpate satisfactorily owing to the comparative thickness of the stomach wall. Also there is seldom any spasm corresponding to the ulcer. The comparison of half a dozen plates may show a rigid area that could easily be missed on the screen, but I fear that it also will fail to give deformities of the outline and filling defects occurring on the anterior and posterior walls of the pyloric end, even when the series is taken from different angles. Each observer works out his own technique according to various conditions. Most of us are governed by part-time service in hospitals, which makes the straight follow-through with the single meal inconvenient. Personally I am glad that this is so, because it has taught me the great value of the confirmation of all findings.

To sum up what I have already said, three things are necessary for effective work, and they are all essentials—i.e., a thoroughly trained observer, apparatus that is really efficient both for screening and for the production of plates, and a reasoned routine method that includes an exceedingly careful visualised palpation, particularly in the upright position.

Direct and Indirect Signs of Gastric Ulcer.

Turning now to the examination, we have the direct and indirect signs of ulcers of the stomach. The demonstration of the actual break in the outline of the shadow caused by an ulcer is the direct evidence on which a definite opinion of ulceration can be given; without this definite evidence, which is becoming more and more frequent as experience increases and apparatus improves, the opinion from the X ray examination must be by deduction from indirect evidence—e.g., spasmodic contractions, definite point of pain, character of the peristalsis, rate of emptying, &c. It is, however, only the direct sign that gives the actual definite information as to the presence of an ulcer. The diagnosis of duodenal ulcer depends on establishing the fact that it is definitely deformed and that this deformity is persistent. With the best screening effect it is possible to see the first part of the duodenum satisfactorily in practically every case if one persists with palpation. The deformity due to ulceration is little guide to the size of the ulcer and, in fact, does not represent the ulcer at all—it is due to a localised contraction that is not seen on the operating table. Personally I cannot distinguish between adhesions and ulcers of the duodenum. I was very sceptical in this matter at first, but for some years have been convinced that

the diagnosis of duodenal ulcer by direct observation is reliable. The need for the radiological symptom-complex on which we used to rely has passed, and it is just as well, for at best it was unreliable and missed many ulcers completely. The indirect signs of gastric ulcer, as in clinical medicine, give a series of clues only, which, if rightly interpreted, may lead with fair certainty to the correct conclusion. On the other hand, they may be misleading. For instance, many a spasm has been taken for an organic hour-glass contraction, delay in emptying has often been interpreted as a sure sign of cicatrisation at the pylorus, and so on.

Interpretation of Signs Associated with Gastric Ulcer.

Hour-glass Contractions.—These are very frequently seen in the stomach, and many of them are pure spasmodic contractions without any underlying local organic lesion to account for them. Even in the organic hour-glass contractions that are seen in the X ray room, there is far greater contraction than is found in the operating theatre—i.e., in the functioning stomach there may be actual disability from the spasm when practically no contraction, cicatricial or spasmodic, is found at the operation. Apart from the local irritation of an ulcer causing spasm, there are many hour-glass contractions met with. Naturally one examines the site of such an appearance very carefully, and it often happens that the mere manipulation causes the spasm to relax. More often, however, one sees the patient from time to time in the course of the examination, particularly on the second day, and finds that the spasm has disappeared. Sometimes, however, belladonna is required to settle the point satisfactorily. Many of the purely spasmodic contractions are associated with duodenal troubles, so much so that they sometimes give the direct clue to the cause of the symptoms. Others again seem to be connected with appendicular mischief, but, per se, these contractions are not direct evidence of either local or reflex lesions—they are seen quite frequently apart from organic disease.

By the courtesy of Mr. E. D. Telford I did a few experiments recently in the operating theatre at the Royal Infirmary, Manchester. By means of electrical stimulation we had no difficulty in producing the spasmodic hour-glass contractions almost anywhere on the greater curvature—they were obviously due to local contractions of the circular fibres. We also stimulated the peritoneal surface of the duodenal ulcer, and this produced no local contraction of the duodenum, but a typical hour-glass contraction such as we so often see in the X ray department, about the junction of the middle and lower thirds of the stomach. I mention this as definite experimental proof of the contention that these spasmodic contractions of the stomach are frequently produced reflexly from the duodenum, and probably also from other parts of the alimentary tract, particularly the appendix. Sometimes these spasms may be so severe as to cause actual obstruction to the passage of food. A persistent localised tender spot on deep palpation, if it corresponds to a spasmodic contraction, becomes very suspicious. The most careful combing out of the shadow is necessary at this site. A small persistent fleck of shadow remaining in the folds of the rugæ and corresponding to the site of the pain on deep pressure, if confirmed, is almost, if not quite, definite evidence of an ulcer. I have had several very small excised ulcers brought down to me that have been detected in this way. One of these measured an eighth of an inch in diameter and was practically nothing more than an erosion.

Delay in Emptying.—This delay does not necessarily mean a pyloric lesion. In fact, the cause of the delay may not be in the stomach at all, and may be reflex from some source of septic absorption either in the lower alimentary tract, the teeth, or elsewhere. There is also the marked delay found when the patient has a headache, or suffers from nausea from any cause. In many patients one finds rapidity of emptying during the first hours associated with delay in emptying the residue. These are nearly always reflex delays, sometimes from appendix trouble.

Where the delay is due to pyloric obstruction, either organic or spasmodic, there are several stages. At first there will be over-active peristalsis and rapidity of emptying. Later on the peristalsis becomes intermittent, and there is a residue of perhaps a half or more in six hours. In the later stages the tone of the stomach is lost, and the semicircular, sharply defined shadow hangs low down in the pelvis, occasionally disturbed by a single wave or perhaps a series of waves of peristalsis. There may be 24 hours delay or more of a definite lesion at the pylorus is indicated. Delay in emptying of the lower sac of an hour-glass stomach is the rule rather than the exception, and, even in the chronic penetrating ulcers high up in the stomach, it is not at all unusual to find such marked delay that one suspects the pylorus, even if one cannot detect any deformity. In a number of these hour-glass stomachs, where no lesion was found at the pylorus, the patients have returned some years after the operation with definite obstruction due to cicatrisation—i.e., the spasmodic obstruction of the first examination which, of course, was not found at the operation, had given place to an organic obstruction. I make no excuse for labouring these spasmodic contractions in various parts, because it is natural that their importance in causing symptoms is not appreciated, when neither the operating theatre nor the post-mortem room can demonstrate them.

Atony of the Stomach.—This is not necessarily a pathological state, and is associated with any condition in which the patient is below par. The mere distaste for the opaque meal is quite enough to account for a considerable degree. Moreover, quite slight atony is exaggerated by the mere weight of the opaque food. Apart from obstruction atony is not necessarily of pathological significance—it is merely a sign of disordered function.

Gastroptosis.—This condition and atony are often associated with each other. Of themselves they are rather of physiological than of pathological significance. In cases of gastroptosis, however, there is one point that always needs investigation—i.e., the duodenum. When the duodenum is loosely attached or has dropped from its original site, no symptoms result, but there is a considerable number of such cases in which the duodenum remains high up, opposite the second lumbar vertebra. In these there is often considerable drag on the attachments with resulting deformity of outline of the duodenum that may be indistinguishable from ulceration. By a curious coincidence, in the last six cases reported as duodenal ulcer by my partner, Dr. J. M. W. Morison, and confirmed by operation, gastroptosis was present. In the early days I used to find hypertonic or normal stomachs in association with duodenal ulcer much more frequently than at the present time. Nowadays I do not consider that the states of hypertony, normality, atony, and gastroptosis are the slightest guide to either gastric or duodenal ulcer.

Peristalsis of the stomach may give some clues. The wave may be interrupted at some point—more suggestive of growth than of ulcer, of course; occasionally, however, it is seen with an indurated ulcer. The point that is of greatest importance is when the waves are intermittent, or in the early stages, unequal in depth. Peristalsis of this character is always suggestive of failing power. A period of complete rest or a period of futile waves followed by a series of powerful waves indicates definite obstruction. Very rarely one sees writhing of the stomach with extremely active peristalsis—the picture of a healthy stomach attempting to overcome an obstruction more or less acute in character. Reverse peristalsis is invariably associated with a definite organic lesion in the pyloric region. Occasionally one can reverse this to the normal rhythm by light massage over the greater curvature.

Fixation of any part of the stomach is only demonstrable by palpation, particularly in the upright posture; whether one interprets a point of fixation as due to ulceration or adhesions depends on the demonstration of the ulcer.

Excessive secretion of more than usual acidity (as tested with a solution of sodium bicarbonate and watching the evolution of CO_2) is strongly suggestive of ulceration close to the pylorus.

Conclusion.

At the Mayo Clinic, Carman, who does the stomach examinations, is also in the operating theatre every morning to see his cases. Their percentage of accurate gastric diagnosis is said to be 95. I was there for several days recently, and all the diagnoses were correct. The operation theatre and post-mortem room are of the utmost importance to the radiologist, and sometimes he may be of service to the surgeon. On a number of occasions a surgeon has persisted at my instance in his search for an ulcer, and has eventually found it. Particularly do I remember an ulcer penetrating into the pancreas, where the surgeon was just about to close the abdomen, and another where after the surgeon had given up the search, the resident surgical officer detected the thickening due to the small ulcer that I insisted was present. It would be useless for me to give statistics of our findings—we make mistakes, but they are fewer and further between as experience increases and as apparatus improves.

THE SEROLOGICAL TEST IN TYPHUS.

A STABLE AND SENSITIVE "DIAGNOSTICUM."

BY W. JAMES WILSON, M.D. R.U.I., D.Sc. BELF.,

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(*A Report to the Medical Research Council.*)

ALTHOUGH the nature of the specific ætiological agent in typhus is still uncertain and although no simple laboratory test apart from animal experiment is yet available for its recognition, nevertheless the almost constant presence of heterologous agglutinins in the typhus patient's serum enables a laboratory diagnosis to be made with almost unerring accuracy at the end of the first week of the disease. These agglutinins act on a great variety of micro-organisms, but chiefly on intestinal bacilli; among the latter the strain of *B. proteus* isolated by Weil and Felix and named X 19 has been most employed for the purpose. Elsewhere[1] I have discussed the various theories which have been advanced to account for the presence of these agglutinins. Nearly all agree that (1) X 19 and its allies are not the cause of the disease; (2) inoculation of animals with the typhus virus seldom causes the appearance of these agglutinins in the animals' serums (Russ and Kirschner),[2] although Weil and Felix and others have obtained positive results; and (3) there is a difference between the agglutinins for X 19 found in the serum of typhus cases and those of men or animals which have been inoculated with X 19. In this paper another point of distinction is added to those hitherto described. The agglutinins in the typhus serum are destroyed by heating to 65° C., whilst those of a person or animal inoculated with X 19 are little affected by this temperature. It is necessary, however, to note that Weil has from X 19 obtained two different strains named "O" and "H," and that he states that the agglutinins developed in the blood of animals immunised with the "O" strains are also heat labile.

When emulsions of X 19 are heated to 56° C. the bacilli lose their agglutinability. The addition of phenol, formalin, and other antiseptics renders the reaction exceedingly slow. These facts have rendered the preparation of a stable and sensitive emulsion difficult, so that living cultures have been most frequently employed. The technique of Weil and Felix is to add one drop of an emulsion in 1·5 c.cm. of saline of the growth of an agar slope to 1 c.cm. of the various dilutions of the patient's serum, and to read the result after 6–8 hours at room temperature. In attempts to prepare a stable sensitive diagnosticum the following means have been employed.[3] Sachs found that the agglutinability of bacilli destroyed by a temperature of 56° C. was restored by heating to 60° C. and 80° C. for one hour, and that after this treatment the addition of phenol had no ill-effect. Csepai recommended a "Fleckfieberdiagnostikum" prepared by heating a suspension of X 19 for two hours at 60° C. or half hour at 100° C. Schiff's diagnostikum is prepared by heating a carbolised suspension for two minutes at 100° C. Neuber emulsified a young agar culture of X 19 in 5 c.cm. normal saline, added 1 per cent. phenol, and then shook for 15 minutes. Five c.cm. of saline were then added, and the mixture incubated at 37° C. for 24 hours, after which it was again diluted with an equal volume of salt solution. Contrary to the experience of Dietrich and Sachs, Neuber claims that the addition of phenol does not affect the agglutinability of the emulsion.

Preparation and Preservation of Active Emulsion.

My experience is that cultures killed in any of the above ways are far less sensitive than living cultures. The reaction is slow and the tubes require to be kept overnight before a reading is taken. Even with living cultures several hours may elapse before there is any macroscopic agglutination in a positive case. I have found that if the bacilli from 18-hours-old broth or agar cultures are suspended in a small volume of saline and rapidly dried at 37° C. in vacuo they readily form a uniform emulsion when saline is added, and that after this treatment quicker agglutination occurs than even with living cultures. Moreover, in the dried condition the agglutinability appears to be retained indefinitely either at room temperature or in the incubator at 37° C.; at least I have found such dried cultures as sensitive after nine months as at the beginning of the experiment. After desiccation, on being suspended in salt solution, the emulsion can be preserved for some weeks in an active state by the addition of 1 in 1000 formalin.

The drying does not kill by any means all of the bacilli immediately. My procedure has been to place 0·25 c.cm. of a thick emulsion of the growth on an agar slope into a test-tube which is put in a water bath at 37° C. and then connected with a water filter pump. In a few minutes the emulsion is splashed around the sides of the tube and desiccated. The tube is then corked and can be kept at room or body temperature. When required for the test a few c.cm. of salt solution are added, and the tube vigorously shaken; then sufficient salt solution is poured in to make the emulsion of suitable opacity. In carrying out the test I recommend incubation for three hours at 37° C. and then one hour at 55° C. I may here quote a few of the experiments on which the above statements are based.

On Jan. 28th, 1921, the agglutinability of X 19 dried in vacuo and kept for 2½ months at 37° C. was compared with a living 18-hour culture of X 19.

Serum P. K.

Dilutions—									
20	40	80	160	320	20	40	80	160	320
Dried bacilli—					Living culture—				
After 2 hours at 55° C.									
+++	++	++	–	–	–	–	–	–	–
After 5 hours.									
+++	+++	+++	+++	++	+++	+++	++	++	++

In some of the experiments the reaction appeared simultaneously in the two sets of tubes, but more frequently the dried bacilli were agglutinated earlier. I may state that with normal serum the dried cultures were not more readily agglutinable.

On March 18th I tested effects of a typhus serum and that of a rabbit which had been immunised with cultures of X 19 on formalinised suspensions, dried and undried.

Serum dilutions—

20	40	80	160	320	640	20	40	80	160	320	640
Culture X19; dried; formalinised; 2 weeks old.						Not dried; formalinised; young culture X19.					

R. H. typhus serum: 2 hours at 55° C.

+++	+++	+++	+++	++	+	–	–	–	–	–	–

Rabbit specific serum for X19.

+++	+	–	–	–	–	+++	+++	+++	+++	++	+

The addition of the formalin to the suspension of the dried cultures does not affect their sensitiveness to typhus serum agglutinins, though with undried cultures it has this effect. The drying of bacilli renders them much less agglutinable by specific agglutinins. I have found this to be the case for *B. typhosus*, *Paratyphosus A* and *B*, and *B. coli*; to this rule proteus X 19 forms no exception. The effect of desiccation in reducing the agglutinability of proteus X 19 by specific serum from a rabbit is shown below.

Dilutions of serum: 3 hours at 55° C.

	20	40	80	160	320	640
Living X19	+++	+++	+++	+++	++	++
Dried X19	+++	++	+	–	–	–

The effect of desiccation on proteus X 19 as regards its agglutinability by the agglutinins in typhus serum and by those in the serum of a rabbit immunised against the bacillus adds another point of distinction between these agglutinins.

So far no satisfactory explanation has been offered of the occurrence of these heterologous agglutinins in typhus serum. From November, 1920–April, 1921, I examined material from over 30 cases of typhus in Belfast. As in my former investigations, I found that in the urine of several of them coliform bacilli which were agglutinated by typhus serum, sometimes in dilutions of 1 in 640, whereas normal serum in 1 in 40 was without effect. These agglutinins developed in the course of the disease. From the urine of one case *B. pyocyaneus* was isolated in pure culture. A few of the serums as the disease progressed agglutinated this bacillus in dilutions of 1 in 160 and 1 in 320, although early in the disease even dilutions of 1 in 20 had no effect. These agglutinins for *B. pyocyaneus* were destroyed by heating for ten minutes at 65°–66° C., and absorption tests showed that they were distinct from those for proteus X 19. Kreuscher [4] also found *B. pyocyaneus* agglutinated by typhus serums.

When the serology of typhus is understood, the presence of agglutinins, not only for the various X strains of *B. proteus* but also for innumerable other bacilli will be accounted for. It may be noted that a strain of *B. proteus* which failed to liquefy gelatine has been found to be almost as readily and constantly agglutinated as the typical liquefying X 19. (Braun and Salomon.[5]) In none of the 30 cases did I succeed in isolating proteus X 19 from the urine.

Summary.

1. Proteus X 19 when rapidly dried in vacuo can preserve its agglutinability as regards typhus serum for months either at room or body temperature.

2. When emulsions are made of such desiccated bacilli they can be for some weeks preserved with 0·1 per cent. formalin without their sensitiveness being impaired.

3. These facts enable us to prepare a stable sensitive diagnosticum and to dispense with living cultures, the advantage being obvious in military service in the field and also in enabling us to use an emulsion of known sensitiveness. It is well known that proteus X 19 in the living state is apt to vary as regards its agglutinability.

4. Desiccation of bacilli renders them less agglutinable by specific serums, and to this rule proteus X 19 is no exception. It would therefore seem that the typhus serum agglutinins for X 19 are different from those produced in the blood of an animal by inoculation.

5. Coliform non-lactose fermenting bacilli are occasionally found in typhus urine and are agglutinated by the serums not only of the individual patient but of other patients.

6. On one occasion a strain of *B. pyocyaneus* was isolated which was agglutinated by a few of the typhus serums.

(*Continued at foot of next column.*)

THE EARLIEST STAGE OF SENILE CATARACT.

BY HENRY SMITH, C.I.E., M.D., M.S. R.U.I.,
LIEUTENANT-COLONEL, I.M.S. (RETIRED).

OUR knowledge of the causation of cataract is hardly even in the stage of theory. Not one of the few theories advanced will stand the test of facts. How could it be otherwise? We know nothing of the nutrition of the lens or of the elimination of its waste in health; pathological anatomy up to the present time does not bear on this issue. Its extreme prevalence in certain localities—the plains of North-West India—and its relative absence in other parts of that country help us little. Where it prevails the diet is chiefly wheat, maize, and peas with fats; where it does not prevail to the same extent—as in the Himalayas, Bengal, Burma, &c.—the chief articles of diet are rice, maize, and peas. One might therefore say that wheat had something to do with it, but caution is required in the consideration of such a theory. Except in Burma the people chiefly belong to the Aryan race, so that there is no racial element in the matter.

It is clearly not a starvation disease in the ordinary sense of the term, because, in the areas most affected, the peasantry are physically the finest in the Indian Empire; there is no question of malnutrition or starvation amongst the peasantry of the Punjab. Undue exposure to glare (actinic rays) has been advanced as a cause, but this influence, again, is as great in non-cataractous as in cataractous areas.

Failing Distant Vision the Earliest Symptom.

The earliest symptom of senile cataract is *failing distant vision*. I think that I was the first to advance this observation. The patient's near vision with spectacles is good for ordinary purposes when his distant vision is reduced to less than one-half. This is a very noticeable fact to anyone in the Punjab who examines railway employees once a year. These men require vision of 6/6. Normal vision is much better than this. When distant vision falls to 6/9, 6/10, or even 6/12, nothing may be observed in the lens further than that it does not transmit light as well as a normal lens. You can observe this fact by having a normal case on one stool and one of these cases on another. On examination of the eye, including the retina of each patient, with an ophthalmoscope in the same light, it will be found that, while in the normal case every structure is clear, the structure of the retina in the early cataract case is easily made out, but the retina appears in the one as though the examination were in a good light and in the other as though the light were poor.

In these early cases black sand-like particles in the periphery of the lens are occasionally seen. In other cases you may see a few opaque striæ making their way from the periphery towards the centre. The centre in either case usually remains clear. These appearances are unusual unless the vision has been reduced below 6/10.

In subjects under 30 years of age the appearance of small oil droplets replaces the above-mentioned appearances. It is evident that the old descriptions of cataract as mature and immature refer only to the later stages of cataract—*immature* implying extensive partial opacity of the lens, *mature* implying complete opacity.

Treatment of the Early Stage of Cataract.

There must evidently be an earlier stage, in that cataract does not develop all at once. As regards treatment of this early stage, many years ago I had

(*Continued from previous column.*)

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an Anglo-Indian patient, aged about 50, who had a very faint nebula in the centre of each cornea due to a recent ophthalmia. Ophthalmoscopic examination showed that she was also suffering from cataract at a very early stage. She told me that her vision had become useless for anything distant or fine. I gave her a subconjunctival injection of cyanide of mercury in each eye, which I believed would clear up the corneal nebulæ, and asked her to write and let me know after some weeks the condition of both near and distant vision. She wrote to say that both had recovered and were as good as they had ever been.

It struck me, on thinking over the case, that this was impossible unless the hyperæmia (which I had induced) had also influenced the nutrition of the lens. In the railway class of patient and others who came to me I was able to see many cases of early cataract, and I treated them on the same lines, being agreeably surprised at my success. I tried cases at different stages and found that up to 6/10 we might expect to be successful in almost every case. Even 6/12 may recover to 6/6. But while the result in 6/10 and less lasts for years 6/12 or more has a tendency to recur. (I do not wish it to be imagined that dead tissue, such as sand-like opacities, or minute opaque striæ, when present, disappear.) I have had many cases under observation for years and am satisfied that the treatment is eminently satisfactory, both for the patient and for the surgeon.

The Danger-Signal.

As regards the future of the question, I hope that the general practitioner will learn to recognise that failing distant vision in people over 40 is the first sign of cataract, and that he would do well to send the patient to an ophthalmologist for investigation. If this is done in every case it seems to me that operations for senile cataract will in the future be less frequently necessary, and that it will be found that the early stage of cataract is more frequent in people over 50 years of age than is usually supposed.

Since I wrote my first paper on this subject I have learnt that eye-baths containing iodide of potassium and other agents have been tried over long periods with success. I have tried iodide of potassium subconjunctivally and have found that from 15 to 18 gr. to the ounce give an efficient hyperæmia, giving the same result as 1 in 4000 cyanide of mercury injection. My opinion is that the agent (dionin included) does not matter; the result depends not on the agent but on the hyperæmia. From my experience of malingerers who use nicotine to produce an ophthalmia I think that drops of nicotine solution would be as effective as dionin or more so.

Also, since the appearance of my first paper on this subject I have learnt that many men have tried this treatment; some have not found it successful, whilst others have found it satisfactory. Diagnosis must be carefully made; failing distant vision from other conditions than cataract is to be considered, and I suspect that the failures have been due to mistaken diagnosis.

By what mechanism does this treatment affect the nutrition of the lens, or the elimination of its waste, or both? If it be assumed that an atheromatous contraction of the channels conveying nutriment to the lens is the cause of cataract then results such as have been obtained for years—from mere dilation of these channels caused by a few weeks' hyperæmia—would not be expected. One would expect the atheromatous condition to recur rapidly, as it does in other structures. It seems to me that to explain these facts we must assume that a special pabulum for the nutrition of the lens is metabolised by some of the cells in the ciliary region, and that cataract is due to a pathological condition of these cells and to the pabulum issued by them, this pabulum being non-physiological and incapable of maintaining physiological nutrition of the lens.

Conclusion.

The results of the treatment would imply that the induced hyperæmia re-establishes the physiological condition of the metabolising mechanism. I think the existence of such a mechanism will not be disputed; it is, of course, a matter of speculation, but the speculation has facts behind it. The influence of a hyperæmia in other regions of the body is beyond the domain of doubt, as is the influence of local blood-letting, which is very closely allied to that of artificial hyperæmia. The influence of local blood-letting over a painful and acutely congested liver is very marked. I have explored with a trocar a large and painful liver for abscess a number of times and failed to find one. Four or five ounces of blood escaped and I was agreeably surprised to find that the patient was quickly relieved of all his trouble and continued to be so.

The question of cataract opens up a wide field for the physiologist, and I hope that physiologists will devote more attention to the nutrition of the lens and vitreous than they have done in the past.

Clinical Notes:

MEDICAL, SURGICAL, OBSTETRICAL, AND THERAPEUTICAL.

A CASE OF
LOSS OF SPEECH, MEMORY, AND HEARING FOLLOWING INJURY: RECOVERY AFTER OPERATION.

BY JOHN J. WADDELOW, J.P., F.R.C.S. ENG.,
MEDICAL OFFICER TO THE WHITTLESEA WORKHOUSE INFIRMARY.

THE following case of loss of speech, loss of memory, and loss of hearing following an injury is of interest. The patient recovered after operation.

W. S. G., aged 21, was admitted to the Whittlesea Workhouse Infirmary as a certified lunatic on Oct. 21st, 1921. When I first saw him he was sitting in a chair and was perfectly quiet. I was unable to make him hear, but could converse with him in writing. He did not know his own name or the name of his father or the name of the street where he had lived in the town, and when his mother visited him he did not recognise her. On visiting days, however, he would write that he expected a friend; up to the time of his injury his memory was a blank. On his arrival at Whittlesea he did not recognise the town, the road, the workhouse, or any person. His vision was unaffected. He had some scars on his scalp and a definitely tender spot 2½ in. behind the right external angle of the frontal bone, 4 in. above the zygoma. I also learned that he had an injury preventing him using his right arm and was taught to sew and write left-handed. This injury cleared up and he was able to resume the use of his right arm.

I am indebted to Dr. J. H. Skeen, of the Fife and Kinross District Asylum, for the following communication dated Dec. 18th, 1921.

"While he was in the poorhouse here he was, I understand, X rayed, and the report, which I did not see, but heard of, was to the effect that there was a definite fracture at the point you mention, with depression. I mention this with some diffidence as I neither saw the plates nor the original report. I sent him to Dundee to be operated on, but as they insisted on an X ray report there, and as this took some time owing to their X ray expert being away for a few days, patient got rusty, kicked up a row, and, of course, the hospital would not keep him any longer, considering him a dangerous lunatic."

Operation.

On Nov 5th I operated, turning down a flap making the tender spot the centre, and trephined the skull with a ¾ inch trephine. I saw no sign of the fracture or depression which I had thought I could feel through the scalp. On removing the disc of bone a large branch of the middle meningeal artery crossed the opening which was occluded; no pulsation was visible or perceptible on pressing the dura. I next incised the dura with a free incision and was met with a gush of blood-stained fluid which I allowed to escape; the brain underneath was plainly visible, pulsating and normal. I closed the wound by continuous suture without replacing the bone, and no drainage was inserted.

The operation was begun at 11.30 A.M.; by 1.45 the patient was conscious, and had recovered his hearing and speech; he asked who had operated and when told immediately said, "Oh, I remember him," and gave a very good reason. The wound healed by first intention, and with the exception of some vagaries in temperature the recovery was uninterrupted. His own account of the injury was that he travelled from London with a friend (?) on June 21st, 1921, and left the train some 30 miles from where he intended to go; his friend discovered that he had friends in the neighbourhood and proposed to go to them. Both being tired by the journey from London and the summer night being fine and warm, they decided to sleep in the open. The next thing he remembered was waking up in hospital minus £18.

The man is now quite normal as regards speech, hearing, and memory.

SPONTANEOUS RENAL FISTULA.

BY E. F. GUY, M.B., B.S. LOND., B.SC. WALES.
JUNIOR MEDICAL OFFICER, GRANGETHORPE HOSPITAL, MANCHESTER.

SPONTANEOUS renal fistula is a rare occurrence, and the following case in a pensioner is of interest.

J. B., aged 23, was admitted to Grangethorpe Hospital on Nov. 8th, 1920, with a discharging sinus in the right loin. He stated that during physical training in August, 1918, he was jumping from a board and slipped; in falling, the right side of his back was struck by a support. The accident was followed by severe pain in the right loin, which almost prevented his walking, and kept him awake at night. Three weeks later a swelling formed in this region. He had slight pain on micturition, but the urine was clear and contained no blood. An abscess apparently formed under the skin and he was admitted to hospital. The abscess was opened without anæsthesia and a quantity of pus evacuated. Although scraped in December, 1918, the abscess failed to heal, and an operation was performed in April, 1919, the nature of which is not known. An X ray taken shortly after admission to this hospital showed indefinite shadows on the right side at level of the eleventh and twelfth ribs, looking very like sequestra in a psoas abscess, and shadows nearer the iliac crest, thought to be calcified glands. Patient had no urinary symptoms or any kind.

First Operation.—On Feb. 10th, 1921, the sinus was explored and found to pass deep to the twelfth rib, part of which was excised. No sequestra were found. After this operation he had scalding at the end of micturition and a little pus in the urine for about a week. The urine was examined for tubercle bacilli but none found. The sinus remained open and further exploration was decided on.

Second Operation.—On June 30th the sinus was followed down, the operation necessitating removal of remainder of the twelfth rib. It was found to pass towards the upper pole of the right kidney with which it communicated. With a probe renal calculi were felt at the bottom of the sinus; three calculi were removed. There was no hæmaturia after this operation and no obvious escape of urine from the sinus. As the sinus still failed to heal, a further X ray was taken, which showed a shadow in the right kidney.

Third Operation.—On Sept. 4th the kidney was exposed by an oblique lumbar incision. It was felt to be very sclerotic and adherent to surrounding tissues and to the diaphragm. The capsule could not be stripped. One large and two small calculi, apparently encysted in fibrous tissue, were removed and the wound closed around gauze plugging.

Following the operation, the urine contained a trace of albumin, but no blood, and again there was apparently no escape of urine from the wound. The sinus now slowly closed up and two months later was dry and soundly healed.

Remarks.—This case agrees with those previously described as to absence of renal and urinary symptoms, and this fact, together with absence of blood from the urine after operation, and of any trace of urine in the discharge from the wound, is probably connected with the encysted condition of the calculi. At no time was there any suggestion of renal colic.

The three operations described were performed by Mr. Geoffrey Jefferson, to whom I am indebted for permission to publish these notes.

LITERARY INTELLIGENCE.—Mr. Murray announces the forthcoming publication of "The Chemistry of the Radio-Elements," by Dr. A. S. Russell, and of a second (revised) edition of "Cancer of the Breast and its Treatment," by Mr. W. Sampson Handley.

Medical Societies.

ROYAL SOCIETY OF MEDICINE.

SECTION OF MEDICINE.

THE DIAGNOSIS OF GASTRIC ULCER.

A MEETING of this section of the Royal Society of Medicine was held on Jan. 24th, Sir W. HALE-WHITE, the President, being in the chair.

Dr. C. BOLTON opened a discussion on the above subject. After a brief description, illustrated by lantern-slides, of the various types of acute and chronic gastric ulcer, he passed to the means of recognition of the presence of an ulcer by (1) the accidents of the disease: hæmorrhage and perforation, the latter being outside the scope of the present discussion; (2) the associated disorders of gastric function; (3) X rays combined with a bismuth meal.

Hæmorrhage.

Hæmorrhage constituted the most valuable diagnostic sign. The hæmorrhage from acute ulcer usually occurred without any preliminary gastric symptoms, and might take the form of hæmatemesis or melæna. In the latter case the patient not infrequently sought advice on account of fainting attacks or anæmia. The hæmorrhage might be mistaken for the bleeding consequent on certain non-gastric diseases—hepatic cirrhosis, anæmias, &c. There was also a form of gastritis which gave rise to hæmorrhage. Hæmorrhage from chronic ulcer was usually accompanied by a characteristic pain, and when it occurred might be said to clinch the diagnosis. Very occasionally chronic ulcers gave rise to melæna without symptoms, and such cases were very difficult to diagnose from cancer.

The Interpretation of Disorders of Function.

These might be motor or secretory; chronic ulcer, by increasing the muscular irritability of the stomach, gave rise to pyloric spasm with diminished rate of emptying, or occasionally to spasm in other parts of the stomach. Acute ulcer had no such effect unless situated close to one of the orifices. Such motor disorders were recognised by the symptoms of pain, and by means of the X rays. Pain, of course, occurred in disorders of the stomach other than gastric ulcer, but the pain of gastric ulcer had usually the following very definite characteristics: it was situated in the epigastric region, and accompanied by tenderness and muscular rigidity; it was severe and recurred frequently in more or less prolonged attacks; it had a constant relation to the taking of food and was relieved by vomiting; and its characters appeared fairly constant in the same individual.

The alterations which occurred in the secretory function in gastric ulcer might occur in other gastric conditions, so that the results of a test-meal could only be of value when interpreted in conjunction with the other findings. The single test-meal giving the total free and combined HCl was open to the objection that the gastric contents varied constantly, while the interpretation of the curves obtained by the fractional method had not yet been fully worked out. Rehfuss regarded the curves of free HCl and of total acidity as being secretory curves, and that type which rises to a higher level than normal, such as is commonly found in pyloric ulcer, as a hyper-secretory curve. With Dr. G. W. Goodhart Dr. Bolton had done some experiments on this subject, and they had formed the conclusion that the curve of total chlorides more nearly represented the secretory curve, since the HCl curve was affected by regurgitation of alkaline duodenal contents when the pylorus was relaxed. They therefore regarded the climbing type of HCl curve, called by Rehfuss "the hyper-secretory curve," to be due to hypertonus or spasm of pylorus.

In general, the finding of an excess of total HCl after a single test-meal, or of the climbing type of acidity curve by the fractional method, were in

keeping with a diagnosis of pyloric ulcer. Ulcer of the body of the stomach did not give rise to definite changes in the test-meal analysis; but the finding of 80–100 c.cm. of mixed gastric and intestinal juice without food residue in the fasting stomach was indicative of gastric ulcer.

The Chemical Aspect.

Dr. J. H. RYFFEL referred to the technique of the chemical examination of the fractional test-meal, and exhibited a number of curves. The free HCl curve seen in duodenal ulcer reached its highest point in one hour and the stomach was empty in 2¼ hours. The climbing type of curve associated with pyloric stenosis had already been described by Dr. Bolton. When a gastric ulcer occurred in the lesser curvature the acidity was not high; the rate of emptying of the stomach (as indicated by the length of time starch or sugar was found in the stomach contents after a test-meal containing starch grains) was also normal. There was often marked "after-secretion," but in spite of this examination of the fæces for blood was the most useful chemical means of diagnosis in these cases. Dr. Ryffel's own practice was to examine the extracted fæces spectroscopically for the spectra of acid hæmatin and of hæmatoporphyrin. The former spectrum occurred only when the quantity of blood was considerable, but the spectrum of hæmatoporphyrin could be obtained with a very small quantity of blood, and could not be produced by any substance in a normal diet. These spectra might, of course, also occur in carcinoma; in which case they were likely to persist in spite of rest and medical treatment, while the bleeding from gastric ulcer was usually stopped, or at least much reduced, by these means.

Dr. A. E. BARCLAY'S remarks on the X Ray Diagnosis of Gastric Ulcer are published in full on p. 219 of this issue.

The Surgeon's Point of View.

In the absence of Sir CUTHBERT WALLACE, his contribution to the discussion was read by the Secretary. Sir Cuthbert Wallace noted that the surgeon generally saw late cases, and was therefore unable to compare the early symptoms with those of other gastric lesions. In establishing the diagnosis, he considered the clinical history all-important, other special methods of examination merely tending to confirm or refute the diagnosis. The periodicity of the attacks of pain was significant and the occurrence of long intervals of freedom from symptoms raised the question of the origin of the pain. Did the ulcer become healed or merely painless? Was it the friction of stomach contents, or the irritation of gastric juice, or the disturbance of motor functions that produced the pain? The typical pain of gastric ulcer was associated with tenderness in the epigastrium, occurred at a definite interval after taking food, and was relieved by vomiting. Occasionally the pain was constant, and then extramural adhesions or carcinoma was suggested. Sir Cuthbert Wallace had little experience of fractional test-meals and had not found the single test-meal very helpful, except that a high HCl content was suggestive of ulcer near the pylorus, and absence of HCl occurred in chronic dyspepsias and acute carcinoma; in the latter case lactic acid was often present.

X ray examinations he considered most helpful by showing one of the following signs: (1) The abiding patch of bismuth at the seat of ulcer, most readily seen on the profile of the stomach. (2) Constriction deformity, that due to cicatricial contraction having an open V shape, while that due to spasm was very narrow, the two sacs being almost in contact by their peritoneal coats. (3) The filling defect often associated with carcinoma. (4) Abnormality of the duodenal cap generally indicative of a lesion near the pylorus.

Differential diagnosis from carcinoma was often very difficult: but a comparatively short history of gastric trouble in a middle-aged individual, combined with an absence of HCl and the presence of lactic acid in the test-meal, and a filling defect after a bismuth meal, was indicative of carcinoma. Many cases could only be diagnosed by laparotomy, which, in Sir Cuthbert Wallace's opinion, was indicated whenever reasonable treatment had failed to relieve symptoms.

Some Clinical Signs.

Dr. W. GORDON said he could hardly believe "gastrostaxis" caused death from hæmorrhage, and suggested that the bleeding in these cases occurred from œsophageal veins which escaped the notice of the post-mortem examiner. In gastric perforation "extended gastric resonance" was a more useful diagnostic sign than diminished hepatic dullness; the hyper-resonance often reaching half-way up the sternum when liver dullness persisted on the right side. Acute pancreatitis simulated perforation and would be more often diagnosed if this were borne in mind. The onset of diabetic coma accompanied by severe epigastric pain and rapid collapse also mimicked gastric perforation; the urine should therefore be examined for sugar to exclude this.

In the diagnosis of sub-diaphragmatic abscess leucocytosis was helpful. Dr. Gordon was in the habit of making simple microscopic observations from an ordinary blood film, from which any considerable degree of leucocytosis became immediately apparent. These abscesses were sometimes latent. Dr. Gordon quoted a case where the abscess remained latent for 12 months and then perforated into the thorax, causing a fœtid expectoration. Syphilis as a cause of gastric ulcer was rare in this country, but occasionally occurred. He quoted a case in which gastroenterostomy for gastric ulcer did not give relief of symptoms, and improvement only occurred when potassium iodide was exhibited. Dr. Gordon's experience confirmed the older view that carcinoma only rarely became grafted on gastric ulcer. He thought that the contrary view was due to the fact that certain distinguished surgeons attracted a highly specialised class of clinical material wholly unsuited for general deductions. He had found the most valuable diagnostic sign of gastric cancer to be diminished cardiac dullness in the recumbent position. The typical recumbent cardiac dullness in a case of gastric carcinoma was about the size of a postage stamp, but a recumbent dullness beginning above at the third or fourth costal cartilage and having a width of an inch or an inch and a half was suggestive. Ordinary emphysema must, of course, be excluded. A similar diminution in the cardiac dullness occurred in the extreme weakness of starvation, which must also be excluded. Finally, Dr. Gordon expressed his disapproval of laparotomy for diagnostic purposes; this was only justifiable when every other means of diagnosis had failed. Abdominal exploration spelled abdominal adhesions which might prove highly regrettable acquisitions.

Examination of the Patient in Pain.

Dr. J. A. RYLE said that he wished to bring out points in both laboratory and clinical diagnosis. As regards the former the hypersecretory type of curve obtained from fractional test-meal analysis occurred in conditions other than gastric or duodenal ulcer—namely, gall-stones, tabetic crises, &c. He thought that the resting secretion of the stomach should be more frequently examined. The presence in the fasting stomach of 50 c.cm. or more of highly acid fluid was strongly suggestive of ulcer near the pylorus. Amongst laboratory tests he regarded the X ray findings as most valuable in gastric ulcer, and the fractional test-meal results in duodenal ulcer. From the clinical aspect he suggested that more valuable evidence would be obtained from the examination of the patient while he was actually suffering from pain, since the other signs which reflexly accompanied the pain could only be elicited with certainty during its incidence. These were superficial hyperalgesia induced by gentle stroking of the skin, which occurred in 8 per cent. of cases; increased abdominal reflex on the left side in the case of gastric and on the right in the case of pyloric or duodenal ulcer, in 16 per cent; deep hyperalgesia tested by plucking the skin, about 40

per cent.; increased muscular tonus, 16 per cent.; and deep tenderness to the left or right of the midline, according to whether the ulcer were gastric or duodenal, 75 per cent. All these signs he regarded as being evidence of the presence of active unhealed ulcer, and they were so valuable that the question sometimes arose whether it would not be justifiable to induce the pain in a patient in order to elicit these signs.

Two Schools of X Ray Practice.

Mr. J. M. REDDING, speaking of the X ray diagnosis of gastric ulcer, pointed out that there were two different schools of X ray practice: the continental, in which reliance was placed mainly on indirect evidence, and the American method, which relied on the demonstration of the shadow of the ulcer. It was his practice to conform to the latter, and he believed that if certain precautions were taken almost all ulcers could be demonstrated. One essential precaution was that the opaque meal must be sufficiently fluid to penetrate into every minute cavity in the stomach, so as to render visible even very slight deformity. The deformities produced by gastric ulcer had been described by other speakers and no deformity should be diagnosed as an ulcer unless it were absolutely constant at repeated examinations. The worst enemy of the radiographer was muscular spasm, which in many cases very closely mimicked pathological conditions. Most of those cases submitted to operation, on a radiographic diagnosis of ulcer, in whom no ulcer was discovered were due to this. Belladonna exhibited in sufficiently large doses would inhibit this spasm.

Further Points.

Dr. T. IZOD BENNETT maintained that the gastric secretion was in no way altered by gastric ulcer, and that the type of curve obtained by the analysis of fractional test meals depended entirely on the state of the pylorus. True gastric hypersecretion was in no way connected with gastric ulcer, although it might occur in certain gastric affections sometimes accompanying ulcer. As a test of true gastric hypersecretion he maintained that the tension of alveolar CO_2, which varied with the acidity of the gastric secretion, provided a more certain index.

Conclusion.

The PRESIDENT remarked that in Fagge's "Medicine," published in 1890, duodenal ulcer was hardly mentioned. The immense progress in diagnosis made in the ensuing three decades was due in the first decade to the surgeons, in the second to the chemical pathologists, and in the third to X ray workers. Since 1920 practice varied in different clinics. At the Mayo Clinic they claimed that 95 per cent. of accurate diagnoses were made by radiographic methods. He doubted whether such accuracy had been attained or could be claimed in this country, and he thought it would be most instructive to obtain the figures in the practice of British surgeons.

In a brief reply Dr. BOLTON said that early diagnosis must in future, as in the past, depend on the clinician. Many laboratory aids to diagnosis might be used, but no absolute dependence could be placed on any one of them.

SECTION OF EPIDEMIOLOGY.

EXPERIENCES WITH THE SCHICK TEST AND ACTIVE IMMUNISATION AGAINST DIPHTHERIA.

A MEETING of this section of the Royal Society of Medicine was held on Jan. 28th, Dr. A. K. CHALMERS, the President, being in the chair.

Dr. S. MONCKTON COPEMAN read a report on an investigation undertaken at the Mitcham Schools of the Holborn Guardians of Improved Methods for the Prevention of Diphtheria. He said that the children of the Mitcham Schools had suffered invasion by scarlet fever, diphtheria, and tonsillitis more or less continuously since September, 1920. Twenty cases of diphtheria had occurred in 1921 between March 24th and August 4th. Cases diagnosed as tonsillitis had also occurred, but five of these proved to be carrying the diphtheria bacillus in their throats. Swabs were taken from the throats of all the children and teachers in June, 1921, all negative. Subsequently swabs were taken from the noses of all the children in the infants' department; from one of these, "Fred A.," the Klebs-Löffler bacillus was isolated in pure culture. The cultures, however, proved to be non-virulent. On July 21st, 1921, the boy was removed to the isolation block, but two further cases of diphtheria, both in the infants' department, were notified on July 22nd and August 4th respectively. The first of these cases might have been infected from "Fred A.," while in the second instance this could hardly have been so.

With the consent of the guardians the following plan of investigation in these schools was entered upon. The children were swabbed in nose and throat by Dr. A. J. Eagleton and subsequently underwent the Schick test at the hands of Dr. R. A. O'Brien. The left forearm was used for the test and the right for the control with toxin previously heated to 75° C. The best site for inoculation was found to be nearer the wrist than the elbow, as the skin was less sensitive in this area. After the Schick test had been performed the children were examined daily for a week, and occasionally for about a month. The readings were made independently, that previously made not being consulted. As a rule the early readings proved accurate but in some cases this was not so, thus confirming the experience at Bristol that it was inadvisable to express a definite opinion as to the interpretation of the Schick test until after the lapse of at least 96 hours. Owing to difficulty in determining the reading it was occasionally necessary to repeat the test, and in these cases further confirmation was obtained by direct estimation of the antitoxin content of the blood.

Immunisation of Susceptible Children.

The total number of children was 329, all of whom had been tested. Including "combined" reactions under the heading of "positive" and "pseudo" reactions under the heading of "negative" 102 of the total were classed as "positive," that is, susceptible to attack by diphtheria. All the susceptible children were immunised by means of toxin-antitoxin injections. For the first injection 0·05 c.cm. of standard toxin-antitoxin solution was originally employed followed by successive doses of 0·5 c.cm., 1 c.cm., and 1 c.cm. In later cases the initial dose was 0·25 c.cm. or even 1 c.cm. The only child who had so severe a reaction (rash at site of injection, rise of temperature, and anorexia) that it was considered advisable to transfer her to the isolation quarters had received an initial dose of 0·05 c.cm. only. She was evidently specially susceptible, since even the larger initial dose employed later did not inconvenience the other children. As the result of the later higher doses about 17 per cent. of the children exhibited a bright red rash over an area of 5 in. by 3 in. or even more. But in spite of this alarming appearance the children seemed quite well, eating, sleeping, and even playing normally.

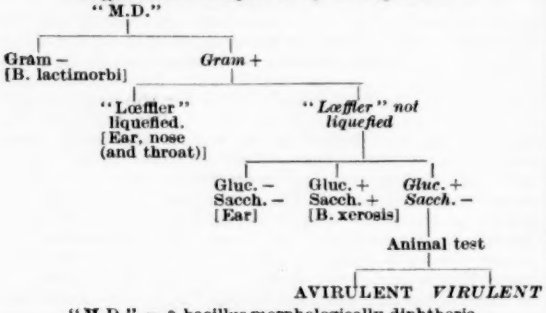
Dr. A. J. EAGLETON read a paper on the

Bacteriological Examination of 300 School-children.

During the wane of a diphtheria epidemic in an institutional school at Mitcham nose and throat swabs were taken by Dr. C. C. Okell and himself from all the inmates. 329 children were so examined (Series 1) and the process was repeated eight weeks later on 327 of these children (Series 2). Series 1 showed a carrier rate of 5·47 per cent., Series 2 a rate of 1·8 per cent., the diagnosis of the diphtheria bacillus being made on morphological grounds only. In Series 1 virulent diphtheria bacilli were isolated five times and avirulent three times. In Series 2 no virulent bacilli were isolated, but avirulent diphtheria bacilli four times. Comparing the results with those obtained in a series of diphtheria convalescents, and bearing in mind the pitfalls met with in routine morphological diagnosis of diphtheria bacilli, Dr. Eagleton felt that

a knowledge of the percentage of contacts from whom virulent diphtheria bacilli could be isolated was of more value than the finding of the "carrier rate" by a method of diagnosis depending solely on morphology. His conclusions were: (1) that in the case of swabs from suspected cases of diphtheria a morphological diagnosis was sufficient; (2) the same was true of swabs from convalescents suspected of being persistent carriers; (3) that in the examination of swabs from "contacts" or normal population the diagnosis should not be made on morphological grounds alone, but the true diphtheria would have to conform to the tests in the following table:—

Differential Diagnosis of B. diphtheria.



"M.D." = a bacillus morphologically diphtheria.
Gluc. = glucose. Sacch. = saccharose.

Mr. A. T. GLENNY read a paper on

Laboratory Control of the Schick Test and Active Immunisation.

He said that the standard adopted by Schick of 1/50th M.L.D. of toxin as a test dose for the Schick test was not ideal. The test was quantitative, depending upon neutralisation of toxin by antitoxin. Antitoxin also neutralises toxoid, and as toxoid was present in varying proportions in different batches of toxin, a standard depending upon toxin content alone might give different results with different toxins. It was possible to produce a toxin of which 1/50th M.L.D., as the Schick test dose, would condemn as susceptible individuals with as much as 1/10th unit of antitoxin per c.cm. of blood, while another toxin would pass as immune those possessing only 1/100th unit. Until a more satisfactory standard involving neutralisation of antitoxin was adopted it would be necessary carefully to choose the toxin to be used for the test. Toxin in high dilution was very labile, and each preparation must be controlled by animal tests. Two methods were in use: (1) the determination of the minimal reacting dose; (2) the titration against antitoxin. Both methods involved intracutaneous injection into guinea-pigs. The second of these methods would form a satisfactory standard for the dose to be adopted for different toxins. Doubtful Schick reactions could be controlled by determining the antitoxin content of the blood of the individual under test. For such determination the usual intradermic method of testing was used, with slight modification necessary in dealing with small quantities of blood and low antitoxin content. The preparation of toxin-antitoxin mixtures for active immunisation needed careful control. The mixtures must be shown to be non-toxic for guinea-pigs in doses of 1 c.cm., according to the recommendation of American authorities. In addition to these, however, the immunising properties should be tested on guinea-pigs and rabbits. When such methods of testing antigenic values were established the immunising values of the mixtures might be increased by selection of toxin used.

Dr. R. A. O'BRIEN read a paper describing the results obtained from the

Schick Test and the Subsequent Active Immunisation.

Of 300 children 31 per cent. gave a positive result when tested by the Schick method. This figure closely resembled that found by Park and Zingher in New York. Repeated tests on the same subjects gave the same results. Of readings made on the first day 95 per cent. agreed with the final readings of the fourth day. When readings were recorded as "doubtful" it was probable that nearly all such cases were really immune, assuming that the toxin dilution used had been full of potency and the injection technique correct. Eighteen children who had had diphtheria some weeks earlier were tested; 3 gave a positive Schick response, 2 a negative, and 13 a negative (and pseudo) reaction. Five carriers of virulent bacilli were tested, and all gave a negative reaction. It was probable that all true carriers of virulent bacilli gave a negative Schick response; if positive, they were incubating the disease and would suffer very much in the immediate future. Avirulent carriers might give a positive or negative reaction; of 7 tested 1 gave a positive Schick reaction, and 6 a negative. All children giving a Schick positive reaction were immunised with toxin-antitoxin mixture. Ninety-nine were tested 11 weeks later—2 only gave a positive response, the remainder were immune. These two had been reinoculated and now give a negative Schick reaction. Practically no general reactions occurred; local reactions were common but caused very little interference with the children's activities.

Discussion.

Sir G. BUCHANAN said that the Schick test would prove of the greatest value in schools and institutions where active immunisation of those giving positive reactions on the lines described could be practised.

Prof. C. J. MARTIN said the discussion had amply demonstrated the practicability of applying the Schick test on a large scale by experts. The difficulty of keeping the diluted toxin must, however, be overcome if the test was to be of value to the profession in general.

Dr. W. W. C. TOPLEY commented on the fact that in cases where passive immunity by the injection of antiserum had been acquired the individuals did not develop an active immunity from having recovered from the disease. This ought to be reflected in a greater incidence of second attacks of diphtheria as a result of the treatment by antiserum. Statistics ought to be obtained to prove whether this were so.

Dr. E. W. GOODALL said that results similar to those described by Dr. O'Brien and others had been obtained by one of his friends who had performed the Schick test in about 400 cases. There was, he thought, still some risk involved in the production of active immunity by toxin-antitoxin injections, especially where the mixture had not been prepared by an expert; and for that reason, in the presence of an epidemic, he would prefer to use antitoxic serum to immunise those exposed to the risk of infection. As regards the frequency of recurrence after the use of antitoxin in the treatment of diphtheria he doubted whether it was increased; second attacks and relapses occurred in cases where serum had not been employed.

Dr. F. N. K. MENZIES foresaw administrative difficulties in the way of the employment of the Schick test and toxin-antitoxin immunisation on a large scale. The consent of parents would be difficult to obtain except during the occurrence of an epidemic.

The PRESIDENT remarked on the great value the Schick test appeared to have from a public health point of view. There were still many points to be worked out: for instance, could the test followed by toxin-antitoxin immunisation be employed during a febrile condition? It was almost impossible to perform a successful vaccination during an attack of measles. Further, what would be the proper course to pursue, during an epidemic, in the case of an individual whose first-day "reading" after a Schick test was positive? It was questionable whether one should wait for the confirmatory fourth-day "reading" or immunise the patient at once by means of antitoxic serum.

WEST LONDON MEDICO-CHIRURGICAL SOCIETY.

A CLINICAL meeting was held at the West London Hospital on Jan. 13th, Sir G. LENTHAL CHEATLE, the President, in the chair.

Exhibition of Cases and Specimens.

Mr. SANGSTER SIMMONDS: Case 1. Ossifying, spindle-celled sarcoma in a man aged 31. The tumour had arisen in the thigh in the site of a contusion caused by a large shell fragment three years ago. At operation the tumour was found to be unconnected with bone, but to involve the adductor magnus and femoral vessels. It was removed, together with 3½ inches of the femoral artery and vein. The microscope showed the tumour to be an ossifying spindle-celled sarcoma. The patient had recovered without any complication. —Case 2. Congenital deformities in an infant aged 8 months, showing: (*a*) transposition of the heart, (*b*) absence of the left nipple, (*c*) congenital bands from the left pectoralis major to the internal condyle of humerus, (*d*) post-anal dimple.

Dr. HERBERT CHAMBERS: A case of congenital absence of the right upper limb in a man aged 37, showing development only of the fixed portion of the shoulder girdle. The free portion of the arm was represented by a finger-like process of soft tissue attached to the lower part of the skin over the glenoid border of the scapula. Dr. Chambers remarked on the rarity of the unilateral deformity, most cases reported being bilateral.

Mr. OSWALD ADDISON: A branchial cyst in a woman of 35. The cyst had been aspirated and the fluid withdrawn found to be typical of that found in dermoid cysts.

Mr. NEIL SINCLAIR: Case 1. A cystic swelling in the neck of an infant aged 1 month, shown for diagnosis. The child's birth had been easy and non-instrumental and the swelling present since birth. The diagnosis rested between a cystic hygroma or a cyst of branchial origin.—Case 2. An interstitial hernia associated with imperfect descent of the testis, in a boy of 16.—Case 3. Large femoral and inguinal herniæ on the same side in a man aged 61.—The PRESIDENT considered this a suitable case for operation by his recently introduced subperitoneal method.

Dr. JULIUS BURNFORD: Case 1. A girl of 16 with subacute infective polyarthritis treated by colonic lavage and intestinal antiseptics, with success.—Case 2. A case of retro-bulbar neuritis associated with influenza in a boy aged 8.

Mr. RODNEY MAINGOT: Case 1. Chronic myositis ossificans traumatica in an ex-cavalryman aged 50. There were multiple lesions in the left thigh and a large plaque in the right. The condition had been accidentally discovered in the course of a routine examination.—Case 2. Central dislocation of the head of the femur in a man of 50 successfully reduced and subsequently treated by abduction and later awalking. The man had recently been able to return to work.

A discussion on these cases took place, the speaker including Dr. S. D. CLIPPINGDALE, Dr. H. H. SANGUINETTI, Dr. HALLS DALLY, Surgeon-Captain GUY CHAMBERS, Dr. F. G. LLOYD, and Dr. RICKARD LLOYD.

DEVON AND EXETER MEDICO-CHIRURGICAL SOCIETY.

THE annual meeting of this Society was held at the Royal Devon and Exeter Hospital on Jan. 12th. In the absence of Dr. P. H. STIRK, the retiring President, Mr. RUSSELL COOMBE was in the chair.

The following officers were elected for 1922:—President, Dr. Shirley Steele-Perkins; Hon. Sec., Mr. R. Wayland Smith; Reporting Hon. Sec., Dr. G. L. Thornton; Treasurer, Mr. A. L. Candler.

Dr. H. C. JONAS (Barnstaple) read a paper entitled "A Survey of the History of the Study of Anatomy," and traced his subject from the days of Galen up to the discoveries of Harvey. He drew special attention to the fact that Harvey was the first really and thoroughly to examine the theories of others in order to sift the true from the false, and thus to deliver the study of anatomy from the chains in which it had been bound by superstition and ignorance born of religious prejudice. In conclusion, Dr. Jonas exhorted his audience to hold to what they discovered themselves when the ground was sure and not to be too easily turned away from a well-founded opinion by views expressed by another.

Dr. SHIRLEY STEELE-PERKINS congratulated Dr. Jonas on the wealth of information he had brought to bear upon his subject.

Dr. W. GORDON, Mr. A. L. CANDLER, and Dr. R. EAGER joined in the discussion.—Dr. JONAS replied.

ULSTER MEDICAL SOCIETY.

A MEETING of this Society was held on Jan. 26th, Dr. ROBERT HALL, the President, being in the chair, when a paper entitled

Hints on the Diagnosis and Management of Cases of Enlarged Prostate

was read by Mr. ANDREW FULLERTON. He said that enlarged prostate was not confined to the elderly. One of his patients had symptoms at the age of 36, another was operated on at the age of 45, a third, aged 47, suffered from uræmia as the result of long-continued prostatic disease. The obstruction might be due to a median prostatic bar, a nodule or nodules in the prostatic urethra, the pressing together of two hypertrophied lobes, a cushion of prostatic tissue projecting into the bladder, or to an irregular, elongated, and displaced posterior urethra from unequal growth of the prostatic enlargement. Mr. Fullerton enumerated the symptoms of prostatic enlargement and said that diagnosis might be obvious or might involve difficulty. The presence of a stone, a pedunculated polypus at the neck of the bladder, a papilloma of the bladder, or a malignant growth might cause symptoms simulating enlarged prostate. The cystoscope and the urethroscope should be used with caution. In septic or uræmic cases the application of the cystoscope might be fatal; even when used with the greatest care, this instrument might inflict considerable trauma in the distorted urethra. The use of the catheter required care and the strictest antiseptic precautions. X rays might be useful in the detection of débris.

The management of the cases was next considered. Patients suffering from frequency of micturition should be warned against straining. The passage of a few drops of urine would relieve the feeling of fullness, and with time and patience the flow might return. To avoid retention of urine the patient should be very sparing in the use of tea, coffee, and alcohol; have warm clothing, avoid chill, live regularly, and shun all excesses. Drugs were not of much service. Belladonna was contra-indicated. Massage of the prostate was not likely to lead to permanent benefit. X ray treatment of enlarged prostate might be tried in cases where there was no great danger in delaying radical measures. In cases of retention the distended bladder should be relieved gradually. A soft rubber catheter should be tied in, and the bladder irrigated every day. There was no limit to the time that a catheter might be left in, if the bladder was carefully irrigated with permanganate of potash, oxycyanide of mercury, or nitrate of silver. After an interval of a few days the catheter might be tentatively removed, and if the attack had passed off the patient might resume his ordinary mode of life, pending a decision regarding more radical measures. The treatment of hæmorrhage was often difficult. The patient should be put to bed with the head low, and the foot of the bed raised. Adrenalin, nitrate of silver irrigations, or hazeline might be employed. Operations should be delayed. Every effort should be

made to prevent or control infection of the kidneys. Tying-in of a catheter and irrigation of the bladder were advisable. If the patient had fever and retention of urine, the tied-in catheter or suprapublic cystotomy was preferable to frequent catheterisation. The urine should be carefully watched. If the persistent specific gravity of the urine was under 1015, and the amount over 60 or 70 oz., renal efficiency was impaired and operative intervention should be considered. Steps should be taken to restore renal function before operation. To operate on a patient without studying the state of his kidneys was to court disaster.

The various tests of renal efficiency were then mentioned and explained by Mr. Fullerton. The efficiency of the kidneys might be to some extent restored by regular catheterisation, the use of the tied-in catheter, or suprapubic cystotomy. The tied-in catheter was often very successful. Operative procedure was either intra-urethral, perineal, or suprapubic; Luys, of Paris, reported excellent results with the intra-urethral method. Young, of Baltimore, reported a series of 450 cases treated by the perineal method with 17 deaths, a percentage of 3·77. Freyer had perfected the suprapubic method and had reduced the mortality to 3 per cent.

In the discussion which followed Mr. S. T. IRWIN, Dr. MORRISON, Mr. P. T. CRYMBLE, and Dr. W. D. THOMSON took part.

BRISTOL MEDICO-CHIRURGICAL SOCIETY.

A MEETING of this Society was held on Jan. 11th, Mr. C. H. WALKER, the President, being in the chair.

Sir JOHN HERBERT PARSONS gave an address on

Medicine and Psychology.

After expressing his indebtedness to his former teachers, particularly to Prof. Lloyd Morgan, in the Bristol Medical School, he deplored the general neglect of psychology by the medical profession, and said that the out-crop of psychoses from the late war had emphasised this neglect and had proved the need for a knowledge of psychology among practitioners. Many of the most enthusiastic psychotherapists of the present day were imperfectly acquainted with the older psychology. Sir John Parsons showed that psychology had sprung from abstract philosophy by imperceptible stages, and quoted several definitions of the subject, which he criticised in the general sense that they limited the study of the science too narrowly to one or more of its several aspects. He proposed himself to define psychology as "the science that treats of the laws of evolution, organisation, and manifestations of the mental processes occurring in living organisms in their relation to the organisms in which they occur." He argued, further, that so far as our present knowledge shows, both conscious processes and behaviour are contingent upon nervous processes. This being so, the study of psychology must include that of data of six kinds: the phylogenetic or comparative psychology of animals; the study of individual human minds, or ontogenetic psychology; collective or group psychology; anthropological or racial psychology; psychopathology; and introspective psychology. The study of the instincts had been greatly advanced by investigation of mental abnormality along the lines of which Freud was a pioneer. Sir John Parsons criticised this newer work, particularly on the score of its undue insistence on the reproductive instinct, saying that in this respect—explanation of human behaviour by reference to a single principle—Freud differed only in kind from some of his predecessors; for example, Hobbes, who traced everything to fear, Bentham and the utilitarians to the search for happiness, and Comte and the Positivists to altruism. It was time that medical students were taught psychology at some stage in the curriculum by qualified medical men, particularly by men who had paid due attention to the older work and were not obsessed by new theories. To the objection that this would overcrowd the curriculum of the medical student, he would reply that much of that curriculum could be dispensed with, or at all events relegated to post-graduate and special courses. Psychology should be separated from philosophy and metaphysics and given a status of its own in the faculty of science. This reform might appropriately begin in the University of Bristol, which was privileged to have such an eminent biological psychologist as emeritus professor of psychology.

Prof. C. LLOYD MORGAN congratulated the speaker on his address and gave some account of steps already taken to introduce the study of elementary psychology into the medical curriculum.—Mr. F. RICHARDSON CROSS said that the address was in itself a proof that intensive study of a narrow speciality was compatible with broader studies of the organism as a whole, even of its highest and least easily comprehended functions.—Dr. R. G. GORDON defended the doctrines of Freud on the ground that they owned a physiological basis, and, as an example, linked the theory of the ambivalency of the emotions with the fact of the antagonistic (vagotonic and sympatheticotonic) subdivisions of the autonomic nervous system.—Prof. JAMES SWAIN and Dr. J. R. CHARLES also spoke, and on the motion of the PRESIDENT a hearty vote of thanks was accorded to Sir John Parsons.

ROYAL MEDICO-CHIRURGICAL SOCIETY OF GLASGOW.

A MEETING was held on Jan. 13th.

Exhibition of Cases and Specimens.

Mr. G. H. EDINGTON showed macro- and microscopic specimens of sarcoma affecting an undescended testicle which was firmly fixed in the pelvis between the bladder and rectum. The specimen was from a labourer aged 49. There were no signs of secondary extensions 13 months later. Mr. Edington commented on the unusual situation of the organ and drew attention to statistics as showing special tendency to malignant disease in undescended or malplaced testicle.

Mr. EDINGTON also showed a large urachal cyst removed from a patient aged 50. A palpable tumour in the hypogastrium had been present for between two and three years. It was cystic and resembled a distended bladder, except that it was freely movable from side to side. There were no visceral adhesions, and although firmly attached to the apex of bladder the cyst was comparatively easily enucleated. It measured 13 by 9 cm., and its fluid contents were alkaline and non-albuminous but gave marked reaction for urea.

Dr. JOHN ROWAN showed a kinematograph film illustrating the mechanism of the refraction of the eye and commented upon the value of this method of teaching many subjects. He also referred to its value in recording methods of operation and the condition of patients from time to time as regards appearance, muscular movements, and gait.

Dr. JOHN COWAN made a communication on

The Causes of Death in Chronic Valvular Disease of the Heart.

In a post-mortem series of 100 cases which showed some form of endocarditis at death, 19 cases had acute endocarditis and 81 chronic endocarditis. Of these 81 cases of chronic endocarditis, 37 showed a superimposed acute endocarditis and 44 did not. Of these last 44 cases, death was due in 21 cases to progressive cardiac failure of unknown origin; in 12 cases to pulmonary lesions; in 4 cases to cerebral lesions; and in 12 isolated examples to starvation, otitis media, over-exertion, acute rheumatism, paroxysmal tachycardia, purpura, and heart-block. Chronic renal disease was present in 25 cases. The most common cause of death in 81 cases of chronic valvular disease was thus acute endocarditis, which obtained in 42 per cent. of these patients. Of the 100 cases which presented some form of endocarditis at death, 56 showed an acute endocarditis.

Reviews and Notices of Books.

THE PSYCHOLOGY OF MEDICINE.

By T. W. MITCHELL, M.D. London: Methuen and Co. 1921. Pp. 187. 6s.

Dr. Mitchell was a student of clinical psychology before this subject grew into the position of widespread interest it occupies to-day. In his opening chapters he shows the connexion between the work of the hypnotists, the dissociation theory of Janet, and later psycho-analytical theories and methods; he devotes a long chapter to Janet's views, which the newcomer to psycho-analysis is prone to undervalue and which still provide a useful description of mental states, though they may lack the ætiological value of the more dynamic Freudian conception. Dr. Mitchell will surely admit an error in his claim (p. 117) that Freud's classification of anxiety hysteria and obsessional neurosis preceded Janet's separation of psychasthenia "from the neurasthenic lumber-room."

The author's development of the theory of the unconscious is reasonable rather than dogmatic; he describes psycho-analysis in its three aspects as a psychological method, as a body of doctrine, and as a therapeutic instrument, and, especially in his chapter on dreams, holds even balance between Freud and Jung. He aptly compares the appeal to reason, as a means of modifying neurotic manifestations, with an attempt to put out a fire by pouring water on the smoke; he adopts towards suggestion an attitude more favourable than that of the orthodox psycho-analyst, and brings it into relation with the transference that takes place between the patient and the analyst. In considering the training of the child he warns us against too great strengthening of the repressing forces and emphasises the case for disengaging the child from over close parental attachments. This is sound, but the reader might conclude that all love between parent and child is harmful since Dr. Mitchell does not make it clear that the stage of fervent parent love, though containing certain dangers, is nevertheless a condition of proper emotional development.

The book is a sober and well-balanced presentation of psycho-analytical views considered from a rather wider aspect than is the case in most elementary expositions of the subject.

L'AME DU CHIRURGIEN.

By Dr. J.-L. FAURE. Paris: Editions G. Cres et Cie. Pp. 57 + xvi. 1921. Fr.3.

"Je ne suis point délicat comme vous, et il m'est aussi parfaitement égal de découper un chrétien que la première volaille venue....l'habitude....l'habitude...."

THUS in "Madame Bovary" the famous surgeon Canivet discourses with the apothecary, while the wretched Hippolyte lies sweating with anguish between the blankets. Dr. Bovary stands apart in gloomy meditation thinking how his own reputation in the neighbourhood will suffer from the report of his failure to deal with the village lout's valgus. But of the patient's sufferings as he lies a pitiful victim to the ambitious ignorance of the doctor's spouse, nobody thought save Mme. Lefrançois, who supplied the poor soul surreptitiously with forbidden nourishment.

To counteract such views on the surgeon's attitude towards his profession and his patients as are illustrated by the above extract, and by many of the novels of the 'sixties and 'seventies, Dr. J.-L. Faure wrote in 1903 the little apology which is now republished with a preface by Paul Bourget. For Dr. Faure as for Canivet surgery is a "sacerdoce," but one which takes no joy in bloody offerings, one, on the contrary, where the priest makes a sacrifice rather of himself than of any other. Even if we cannot endorse the ascription of a naturally Christian soul to this outspoken anti-dogmatist—for this is the kernel of M. Bourget's introduction—we at once realise the religious intensity of Dr. Faure's attitude towards human life. The surgeon, he says, lives in an atmosphere of legend. The spectacle of the pain-maddened patient shrieking beneath the knife is unknown to the era of chloroform, and those who would accept an insensibility to the human life and suffering as a qualification of the successful surgeon are sadly in error. Exquisite sensibility on the other hand is required of him, and is by the exercise of his profession continually refined in the surgeon of our days. None more than he receives daily the imprint of powerful emotions, sometimes of an extreme sweetness and delicacy, sometimes of a tragic gravity, always noble and majestic. What the surgeon feels as he awaits some operation which may be the turning point of his career; how he lives through each moment of the crisis, what supreme control he must exercise lest any hint of an inner perturbation should be disclosed to those who stand round him—all this Dr. Faure recounts in a style so simple and intense as sometimes to recall Pascal. But the most unforgettable pages are those in which he describes the strange and beautiful relationship which the surgeon, if he be worthy of his calling, is privileged to enjoy with those who come under his care; the pathetic confidence which he knows in his heart to be unjustified by the extreme doubtfulness of the issue, the gratitude which does not wait for a successful result before it expresses itself with all the pathos of mortal frailty.

The transitoriness of this life—at once its value and its reproach—this is what Dr. Faure has learnt to feel and to appreciate as with instinct transcending calculation he mends the mechanism of life. And beyond it he has learnt to trust in a supreme repose not less desirable than the "éternelle et terrifiante vie" which M. Bourget would so fain have him aspire after in its lieu.

THE DAWN OF MODERN MEDICINE.

By ALBERT H. BUCK, B.A., M.D. London: Humphrey Milford, Oxford University Press; New Haven: Yale University Press. Pp. 288. 25s.

THE subtitle of this book is, "An Account of the Revival of the Science and Art of Medicine which took place in Western Europe during the latter half of the eighteenth century and the first part of the nineteenth." It consists mainly of a series of short biographies of well-known physicians and surgeons, together with those of one or two who are not so well known as they should be. Of these latter Théophraste Renaudot, with whose life Dr. Buck commences his work, was perhaps the most notable. He graduated as Doctor of Medicine at Montpellier in 1606, and although a Huguenot was aided in his charitable schemes by Richelieu. Renaudot organised two great institutions for the betterment of the poor, the one being what we should now call a labour exchange and the other a loan office, where money was lent to the poor at the modest interest of 3 per cent., just enough to pay running expenses. With quite modern intuition Renaudot saw that his ideas wanted advertising, so he founded the *Gazette de France*, which began by being the official journal of the Government, in which his humanitarian schemes were advertised, and some nine years after its foundation combined the features of a medical journal with its official side. Another of Renaudot's philanthropies was the foundation of a "Bureau de Consultations Charitables pour les Pauvres Malades," in other words, a free dispensary, which was started in 1640. He naturally came into conflict with the Paris Faculty of Medicine, and after the death of Richelieu that body succeeded in putting an end to most of his philanthropic work. In recent years a statue has been erected to his memory in his native town of Loudun.

The second section surveys the state of medicine in Western Europe at the beginning of the eighteenth

century; among the prominent physicians of the time were Haller, Van Swieten, and Boerhaave. In the latter half of the century we meet with the names of Reil and Peter Frank, who wrote the first systematic treatise on public health. Other sections of the book deal with medicine and surgery in different European countries—Italy, England, France—and with matters such as the control of small-pox.

Though Dr. Buck's book naturally travels over a good deal of ground which has been traversed before, notably by Camac's Epochs of Medicine and Garrison's admirable History of Medicine, it is yet a most useful compilation.

PRÉCIS DE PHYSIOLOGIE MICROBIENNE.

By MAURICE ARTHUS, Professor of Physiology in the University of Lausanne. Paris: Masson and Co. 1921. Pp. 408. Fr.17.

THE title of this book is not as clear as the rest of it. It is certainly not an account of the physiology of microbes, but is perhaps more nearly a description of human physiology in relation to infection. Twelve of the 16 chapters deal with immunity in its conventional sense—that is, with questions of infection and resistance to micro-parasites in the higher animals. The author thinks that Frenchmen are much too fond of German theories, and need to be recalled to the great tradition of experimentation founded by Bernard and Pasteur. His dislike of speculation was more fully expounded in the preface to his "De l'Anaphylaxie à l'Immunité" (reviewed in THE LANCET, 1921, ii., 1138), and it is easy to sympathise with his abhorrence of the rather common custom of basing an account of immunity on diagrams of side-chains and amboceptors, as if these, and not the sheer facts of experiment, were the fundamental data. In his thesis that the experimental facts must come first Prof. Arthus utters a salutary warning. Occasionally he seems to go too far, as, for example, when he objects to the statement that a toxin is a stimulus which excites some tissue in the body to do something, because physiologists have commonly used "excite" in rather a different sense.

It is piquant to be told that the Wassermann reaction and its modifications are a revival of witchcraft, and the book is well worth reading. The point of view is fresh and rather unconventional, as one would expect from the author of the two successful volumes on physiology and physiological chemistry in the same series; rabbits are used as the chief experimental animal instead of guinea-pigs; the narrative is delightfully vigorous and clear, the experimental basis for each conclusion being set out in a plain and orderly way; the book is cheap as things go nowadays, for the pages are closely printed and there is much small type.

MEDICAL ELECTRICITY.

Medical Electricity, Rontgen Rays and Radium. Third edition. By SINCLAIR TOUSEY, A.M., M.D., Consulting Surgeon to St. Bartholomew's Clinic, New York City. London and Philadelphia: W. B. Saunders Company. 1921. Pp. 1337. 50*s*.

THIS edition has been enlarged by the addition of over 100 pages. The general plan and arrangement of the work is unchanged, the first part dealing with electro-technics, the physiological effects of electricity, electro-pathology (i.e., the study of the harmful effects of electricity on the body), electro-therapeutics, and electro-diagnosis, and the second part with X ray diagnosis, X ray therapeutics, and radium. As in the previous editions, there is a section on photo-therapy; and two pages on physical reconstruction after war injuries are now added.

Of the different methods of testing electrical reactions, the author, Dr. Tousey, pays most attention to the original one; the condenser method is briefly described, while on the chronaxie there is the statement that the determination of the latter is suited to the physiological laboratory, not to the bedside, and that it may take hours to examine one patient. We regret that a full description of the chronaxie is not included, since the method of determining it is free from the inaccuracies which accompany the other methods of testing the reactions of excitable tissues. Though it is, at present, mainly a laboratory method it is exact, and will probably lead to revision of teaching on abnormal electrical reactions. On the question of the depth to which the galvanic current can cause ions to penetrate from the exterior of the body, the author gives the views of several workers, and the conclusion reached is that they penetrate a very short distance only. Nearly a hundred pages are devoted to accounts of the production and uses of high-frequency currents; the use of these currents for the production of diathermy is only briefly considered, and the use of diathermy in surgery is accorded not more than two pages.

The medical uses of X rays and radium occupy nearly half the book. The sections on dental and gastro-intestinal radiography have been enlarged, and the author describes many modifications which he has devised, not only of existing apparatus, but also of methods of treatment and dosage. These include two modified X ray tubes, a fluorimeter for measuring the penetrability of X rays, and a method of measuring X ray dosage. By reason of its great size, the work under review will be found useful mainly as a work of reference. It has been well prepared and the majority of the illustrations are good, though the reproductions of some of the skiagrams are lacking in detail. There is an excellent index of 57 pages.

Medical Electricity for Students. By Miss A. R. I. BROWNE, Member of the Chartered Society of Massage and Medical Gymnastics; Teacher of Medical Electricity at the Western Infirmary, Glasgow. Oxford Medical Publications. London: Henry Frowde and Hodder and Stoughton. 1921. Pp. 231. 12*s*. 6*d*.

THIS book has been written for students preparing for the examination in medical electricity held by the Chartered Society of Massage and Medical Gymnastics, and will be appreciated by them. It is also intended to be an introduction to works on the same subjects by well-known authorities. It is divided into three parts, of which the first deals with elementary physical principles and electrical instruments; in the second, types of electro-medical apparatus are described, and the third deals with treatment. The effects of the various electrical applications on the body are considered; a description of ionic medication is followed by an account of the reactions of muscle and nerve and of the method of testing them by the faradic and galvanic currents, while the treatment of paralysis is briefly considered. Brief accounts are given of electric baths, radiant heat, static electricity, high frequency, and diathermy. In the concluding chapter the diseases which can be usefully treated by electricity are considered.

The physical principles of electricity are clearly presented, and the descriptions of instruments and electro-medical apparatus are good. The diagrams illustrating the plans and construction of the latter will be helpful to the student. It should be borne in mind, however, that practical electrical testing is hardly suitable work for the electrically trained masseuse, because of the many difficulties and fallacies associated therewith. Reactions are easy to test when they are normal, and some cases of R.D. are quite evident, but in the greater number of cases there is much uncertainty, and the preparation of an accurate report requires considerable knowledge and long experience. The statement (p. 175) that if R.D. is complete, complete interruption of the continuity of the nerve is indicated requires revision. The same criticism applies to the statement on p. 180, that the discharge of a condenser is of longer duration when the charging

potential is lower. Miss Browne comments on the dangers of the full-length electric bath supplied by the direct current from the main, but does not mention the use of the alternating current in place of the direct current. The former can be rendered earth-free by the static transformer, and is a far better stimulant than the other. The Schnee bath is an indifferent substitute for the full-length bath when the whole body requires stimulation. When describing the effects of anode and kathode (p. 145) the nature of the electrode, whether an electrolyte or a solid conductor, should be stated; also the fact that pure anodal or kathodal effects cannot be obtained in the human subject, a virtual kathode being in the vicinity of the anode and vice versa.

Much of the treatment described in the last chapter can be conducted by the masseuse under medical direction. Some of it, such as the treatment of wounds and sinuses, of ozæna, nævi, moles, &c., is outside her province, and should be performed only by a medical man.

High Frequency Apparatus. A Treatise for Electrical Engineers, Students, &c. By THOMAS S. CURTIS. London: Page and Company. 1920. Pp. 269. 9*s*.

THIS book, while written mainly for the home mechanic who wants to construct his own high-frequency electrical apparatus, branches into other fields. The physician will be grateful for the advice to go cautiously in the application of the various forms of electricity to the human subject; not only caution, but, in dealing with the cure of baldness, patience is indeed necessary, for we read that "the cumulative characteristics come out after persistent administrations."

PROSTITUTION UND TUBERKULOSE.

By Dr. I. W. SAMSON. Leipzig: G. Thieme. 1921. Pp. 120. M.54.

THAT debauchery is a trusty servant of mortality we know of old. Dr. Samson is well qualified to trace the inter-relations of prostitution and tuberculosis, for he is the author of the best account of the differential diagnosis between pleural and pulmonary oscillations in artificial pneumothorax work, while since 1914 he has attended for the purposes of this study the investigation station of the Berlin police. In a series of workman-like chapters—some of them a little verbose at the outset—he tells us of valuable evidence bearing upon such points as the comparative incidence of the disease in prostitutes and in honest women, the influence of syphilis upon tubercle, of alcohol and drugs upon tubercle, and so forth. His results will be of special interest to sociologists and "rescue" workers, as well as to specialists on venereal diseases and tuberculosis, who will find them worthy of steady consideration. Dr. Samson's clinical material extends to 1300 cases and there are many protocols.

OPHTHALMOLOGY.

Cataract and its Treatment. By HENRY KIRKPATRICK, M.B., late Superintendent of the Government Hospital, Madras. London: Henry Frowde and Hodder and Stoughton. 1921. Pp. 201. 12*s*. 6*d*.

THIS book contains little that is new, but it gives a concise account of the subject of cataract in an easily accessible form. The chapter on the ætiology of cataract only shows how far we are as yet from being able to give an intelligent answer to the question which most patients ask: "What is the cause of it?" We know that it generally occurs in old people, that diabetics are specially subject to it, and that heredity may play its part. Beyond that there is nothing but somewhat vague speculation. A chapter is devoted to the varieties of cataract, and the signs by which the relative hardness of cortex and nucleus in senile cataract may be known. More than half the book is occupied with a description of the ordinary operation of extraction. The author was superintendent of the Government Hospital at Madras, and the account given is of the operation as there practised, expanded from the account already given by the same author in Elliot's "Tropical Ophthalmology," and with many of the same illustrations.

In Madras, it seems, it is quite customary to perform a capsulotomy as the first stage of the operation, before the incision, according to a method devised by Major H. E. Drake-Brockman. Its advantages are said to be that the operator has a better sight of what he is doing, and that in case the patient squeezes violently after the incision, he will be more likely to squeeze the lens out than vitreous. It is not, apparently, the custom at Madras to remove the speculum at this stage of the operation, but a good deal of responsibility is given to the assistant in preventing it from pressing on the eye, and it is somewhat surprising to read that in India "a quite unskilled man who has a sufficiently light touch may soon be rendered a most capable assistant. This is due to the large number of cases handled, and to the fact that Indians of the lower classes have more delicate fingers than Europeans of a corresponding station." The succeeding stages of the operation, either with or without an iridectomy, are described on orthodox lines. The incision recommended is one in the exact line of the limbus, through very nearly half of the corneo-scleral margin, an allowance which is somewhat on the liberal side for most cases, though we agree that it is far better to make the incision too large than too small. A few pages are given to alternative operations, such as Smith's intracapsular expression, and Barraquer's suction operation, but those contemplating their performance are advised to read the original descriptions. In this connexion we may call attention to the article in another column of this journal by Lieut.-Col. H. Smith on the earliest stage of senile cataract. With regard to after-treatment, the modern belief is that too rigid precautions may defeat themselves. The author's practice, when dealing with an old person, is to release the unaffected eye from the bandage at the end of 24 hours, and allow the patient to be propped up in bed. He ties the hands together loosely during the hours of sleep, so as to prevent him from suddenly rubbing his eye when he wakes up. The cardboard shield is also a good protection.

There are many photographs of actual operations in this book, but we doubt whether much can be learnt from them. If they are studied soon after the student has witnessed an actual operation at close quarters they may be useful, but a more liberal supply of diagrams would be an improvement.

Diseases of the Eye. A Handbook of Ophthalmic Practice for Students and Practitioners. Ninth edition. By GEORGE E. DE SCHWEINITZ, M.D., Professor of Ophthalmology in the University of Pennsylvania. London and Philadelphia: W. B. Saunders Company. 1921. With 415 illustrations and 7 coloured plates. Pp. 832. 50*s*.

SINCE its first publication in 1892 this work has taken a high place among text-books of ophthalmology, and although but little important matter is omitted, it remains comparatively moderate in size. The new subjects dealt with in the present edition include conjunctivitis from poison gas—almost all the permanently destructive lesions in the war were due to "mustard-gas." The striate clearing of corneal opacities as observed by Fuchs, and the superficial linear keratitis observed by Spicer and Greeves also receive notice, but here the text would be more easily followed by the help of diagrams. The observations of Holmes, Lister, and Riddoch on localisation in the visual cortex derived from cases observed in the Great War receive a place, and cases of concussion of the eyeball from wounds not actually

penetrating the eye are discussed. In the region of operative surgery several new plastic operations planned to cure deformities of the lids and eye-sockets are described. The number of lid operations is so large, however, that no text-book can be expected to be a complete guide to them. In this one the space devoted to operations for trichiasis—the deformity most frequently requiring operation—is insufficient. The chapter on glaucoma explains recent work on the visual fields, including Bjerrum's scotoma and Rönne's nasal step. The section on corneo-scleral trephining is written by Lieut.-Colonel R. H. Elliot in this, as in former editions. Dr. William Sweet contributes an account of his method of localising foreign bodies in the vitreous, and in the older subjects of skiascopy and anomalies of eye movements the help of Dr. E. Jackson and Dr. A. Duane has been called in. We can highly recommend this edition of a classical work.

Erkrankungen der Aderhaut, der Netzhaut, des N. Opticus; Augenänderung durch Gifte. By Prof. Dr. IGERSHEIMER. Leipzig: G. Thieme. 1921. With 15 illustrations. Pp. 50. M.18.

THIS volume hardly offers sufficient aid in the diagnosis of those parts of ophthalmology of which it treats to make it a successful rival of the standard text-books. The cases of difficult diagnosis are not particularly well chosen. For instance, to confuse detachment of the retina with embolism of the central artery cannot be common, and the difference between disseminated choroiditis and retinitis pigmentosa is so marked that those two conditions would hardly be confounded. On the other hand, to diagnose the cause of an obstruction in a retinal vessel is difficult, and the distinction between retinitis pigmentosa and certain forms of retino-choroiditis may be very hard to make; but on this problem, and on others equally obscure, we get little light. The illustrations in black and white are mostly borrowed from Haab's atlas and Axenfeld's text-book, and they are good. The difference between the typical glaucoma cup and the large physiological cup with a diameter as great as two-thirds of the disc is well illustrated, but there is no hint in the text of the difficulties of diagnosis that occur when the glaucoma cup fails to reach the margin of the disc all round. It is in fact a question whether in some cases of large physiological cup the eye is not on its way to become glaucomatous. We do not think that ophthalmologists will get much help from Prof. Igersheimer's book.

JOURNALS.

JOURNAL OF ANATOMY. October, 1921.—This volume opens with a paper by Prof. J. S. B. Stopford on the nerve-supply of the interphalangeal and metacarpophalangeal joints, founded, like his previous papers in recent numbers of the Journal, on cases of injuries occurring during the war. It is a careful appreciation of the results obtained in the examination of 51 patients, and will be found of great clinical and physiological interest.—Prof. J. E. Frazer gives a short report on an anencephalic embryo, probably the youngest specimen recorded.—Miss Helga S. Pearson follows with an account of the skull and some related structures of a late embryo of lygosoma. This is a description in detail of the condition of skull, &c., not of a controversial or theoretical nature, and will rank among the standard descriptions for future reference and collation.—Dr. Duncan M. Blair, following out Eisler's suggestion that transversely directed fibres of the occipito-frontalis aponeurosis may bear a causative relation to the occurrence of a post-coronal sulcus in the skull, demonstrates in two subjects from the dissecting-room the connexion between the two conditions; some good figures make these conditions very clear.—Dr. T. F. M. Dilworth, in his account of the nerves of the human larynx, makes use of the results of naked-eye dissections of 33 adult specimens. He reaches conclusions which are a compromise between Luschka's views and those of Exner. It may be remarked that his suggestion that the laryngeal nerves are really remnants of a plexus has support in some ways in ontogenetic development.—A case of abnormal position of the iliac and pelvic colon is reported by Naguib Effendi Nicola, from Cairo. A long loop of this portion of the gut was lying in a retroperitoneal position by the descending colon, attached to the transverse colon and duodenum. It would be good if reports of all such cases had diagrams of lines of peritoneal reflection and blood-supply; in the absence of such aids the condition is rather obscure, but seems to have owed its origin to early growth of the loop behind the unattached left face of the abdominal mesocolon.

ARCHIVIO PER LE SCIENZE MEDICHE. Vol. XLIV. Turin, Via S. Massimo 24. 1921.—We have received the 12 numbers for 1921 of this publication, which contains original papers on scientific medicine and is under the editorship of Profs. Morpurgo, Carle, and Micheli, of the University of Turin. The subjects dealt with in these numbers are: The Genesis and Significance of the Amylaceous Bodies of the Nervous System, by Dr. Gamna.—Variations in the Cytological Formula of the Exudation during the Healing of Wounds, by Drs. Torraca and Cotellessa, who show that while the secretions from a wound on the second day contain 85 to 93 per cent. of polynuclears, their numbers decrease as the wound contracts, while the mononuclears increase from 16 to 27 per cent.—Primary Carcinoma of the Cystic Duct, by Dr. Satta.—Histological Researches in Frogs after Extirpation of the Liver, by Dr. Ronca, who describes degenerative changes in the pancreatic protoplasm and in the kidney, the intestines and spleen not being so markedly affected.—Changes in the Saliva during Mountain Climbing, by Dr. Aggazzotti.—The Influence of the Spleen, Kidneys, and Thyroid in the Production of Anaphylactic Shock, by Dr. G. Pistocchi, who, from a large number of experiments, comes to the conclusion that splenectomy and nephrectomy have no definite and constant influence on its production, while thyroidectomy undoubtedly diminishes the sensibility of guinea-pigs to anaphylactic poisons.—Dr. Marrassini gives the results of some of his experiments on the influence of bleeding on blood pressure; for instance, repeated moderate blood-lettings, even though accompanied by a simultaneous infusion of 7 per cent. salt solution to the same amount, caused a progressive lowering of the mean arterial pressure, and a very low level being once reached was maintained for a long period.—Dr. Busacca describes the result of his experiments on the transplanting of tendons hardened in alcohol. In the rabbit and dog a perfect anatomical repair was obtained to such a degree that the junction was not appreciable macroscopically, and on the whole his experiments completely justify the importance given to Nageotte's method in reference to the plastic surgery of tendons and nerves.—Another paper records the experiments of Dr. Baggio on the influence of the thymus on the spleen; he found that the spleen diminished in weight in thymectomised animals.—Dr. Strumia's researches on the various types of pneumococcus during an epidemic of pneumonia at Turin in 1920 are interesting. Four types were recognised: I., II., III. or mucous, and IV. heterogeneous. The frequency of incidence was greatest in Type I. and the mortality in Type III. The mode of onset, course of temperature, character of the expectoration, and complications were all different according to the type of pneumococcus found. The systematic search for the various types would appear, therefore, to be a useful aid to prognosis.—Dr. Bastai describes his investigations on a filtrable micrococcus isolated from the blood, cerebro-spinal fluid, and nasal discharge in a case of epidemic encephalitis, cultures from which failed to produce any pathological results when injected into animals.—An interesting paper on primary sclerosis of the pulmonary artery, by Dr. Mattirolo, is noticed in another column.

THE LANCET.

LONDON: SATURDAY, FEBRUARY 4, 1922.

Epidemic Conditions in Eastern Europe.[1]

THE Health Committee of the League of Nations held its first meeting in Geneva in August, 1921. The constitution of the Committee was strong, as was immediately recognised on the publication of the names in THE LANCET, for the members were chosen on personal qualification as well as being nationally and professionally representative. Among the business before the Committee was the organisation of more rapid communication of information concerning epidemics, so that preventive and protective measures could be taken early and by the joint energies of the populations concerned; such activities being, under the Covenant of the League of Nations, itself an integral part of the Treaty of Versailles, exactly the work of a Health Section of the League. The position seems to demand that the public health organisations of the different nations should be provided with a kind of central clearing-house, which on the one hand would give material, never hitherto available to the scientific epidemiologist, and on the other would furnish the practical man at ports and frontiers with data on which he could rely for his daily action. No one who has been concerned with the collection of information about epidemic and infectious diseases from other countries will be under any delusion regarding the great practical difficulties of creating any really effective central machinery for this purpose. The whole question demands much preliminary study, especially as it is necessary to take full account of, and to build on, existing international agreements, such as the Rome Convention, 1907, and the International Sanitary Convention, 1912. The Health Committee of the League has very wisely recognised the danger of being prematurely committed to an insufficiently considered and costly world scheme. While this question is being studied, the Committee has concentrated on a practical matter the urgency of which cannot be disputed—namely, the need for obtaining facts as to the epidemics in Eastern Europe, and particularly in Russia, where all the customary sources of information, including consular reports, are at present lacking.

As a result of this policy, there has just appeared from the Health Section of the League No. 1 of Epidemiological Intelligence dealing with Eastern Europe in 1921. An introductory note to the first issue states that these bulletins will be distributed as soon as possible after information of a sufficiently important nature has been received and analysed. The information contained in the first number, dealing with the evolution of epidemics in Eastern Europe generally and in Russia in particular, has not been easily obtainable, while no recent data have been received from Roumania, the Serb-Croat-Slovene State, and Greece. The data are obviously far from being complete, but they represent an analysis of the figures transmitted to Geneva, checked by information derived from various sources. Although those responsible for the production are modest in regard to their performance, and though probably the form of the bulletin will be improved in future issues, still what has been done must be of real value. Spot-maps and curves illustrating the localities and waves of intensity of epidemics in Eastern Europe will serve to bring home to the thinking world the measure of the risks implied. The bulletin deals separately with cholera, typhus, relapsing fever, enteric, dysentery, and scurvy. The return of typhus cases in Russia and Poland make appalling reading, while it is clear that the sanitary cordons erected with splendid energy by Poland are subjected to temporary breakdown with immediate spread of disease.

A special note on the health situation in Russia was presented recently by the Special Commission sent to Russia by the Health Committee of the League, and reading this in connexion with the bulletin of the League of Nations (Health Section) the question arises as to whether the epidemic returns from Russia can be relied upon If so, they tell a tale of unmeasured horror. For the years 1919 and 1920 some seven and a half million cases of typhus have been notified in all territories of the ancient Russian Empire, excluding Poland, Lithuania, Finland, and Latvia. This is the official figure, but the People's Commissary for Health being interrogated admitted great undervaluation, and, according to the note of the Special Commission, about 15 million cases occurred. Prof. TARASSEVITCH seems not only to have concurred in this estimate, but to it he would add another five millions for those extensive areas from which no returns of any sort were available owing to the disintegration of internal administration. The figure of 20 million cases seems monstrous, but it must be taken as a starting point in any attempt to estimate the extent of the Eastern endemic focus of typhus. The Russians indeed were satisfied that typhus had considerably decreased during 1920, but that meant a total for the year 1920 of 2,939,000 official notifications, a truly gigantic figure for a "good" year, particularly if we bear in mind that the annual pre-war average never exceeded 150,000 odd. Some confirmation is furnished by the results of the census taken in 1920–1921 in 50 out of the 83 governments of Soviet Russia. In Petrograd the ascertained population of 706,000 has to be contrasted with 2,319,000 in 1913, and while this is the most striking fall, huge decreases are shown in nearly all of the more important Russian cities. There can be no doubt that much of this decrease—independent, it will be noted, of the subsequent famine in the Volga area—has been attributable to epidemics. The mere mention of such figures as the above shows how gigantic is the task before the Health Section of the League of Nations even to appraise the situation and indicate to the nations of the world the facts of disease in order that their social and political, as well as their public health bearings, may be understood.

[1] Epidemiological Intelligence: Eastern Europe in 1921. Publication Department, League of Nations, Health Section; Geneva.

Probability in Medical Investigations.

THE natural bent of the medical mind is, unfortunately perhaps, away from statistics, and a majority of medical officers of health will welcome the recent recommendation of the Ministry of Health that elaborate and detailed statistics should be published only in every fifth annual report. But, although this attitude of mind exists, and most medical men receive inadequate instruction in the use of arithmetic in their routine, statistics become essential when it is required to summarise the results of elaborate work. Their more complex use is required when the nature of the association between two sets of natural phenomena s to be investigated. For those who are engaged in such investigations, the recently published treatise on Probability, by Mr. J. M. KEYNES, possesses great value. The main thesis of the book may be said to be that probability is more satisfactorily reckoned with logic than with mathematics, although the biometricians apparently have convinced most people in this country to the opposite effect. The Port Royal logicians and LOCKE gave weight to experience in apportioning the importance of factors producing a given result; while, as Mr. KEYNES states, "the traditional method of the mathematical school essentially depends upon reducing all the possible conclusions to a number of 'equi-probable cases.'" Behind this conception is what is known as BERNOULLI'S "Principle of Non-Sufficient Reason," which has been searchingly criticised by VON KRIES. These criticisms are extended by Mr. KEYNES, who lays stress on the important point that not all probabilities are capable of numerical statement, and that direct judgment comes into important play in determining the equality or inequality of probabilities in a given problem.

HUME remarks forcibly that "when we give the preference to one set of arguments above another, we do nothing but decide from our feeling concerning the superiority of their influence." Developing this point, Mr. KEYNES expresses his general disagreement with the fundamental premisses upon which rests much of the work in probability and statistics of the biometrical school in this country, and asks what substitute has the frequency theory to offer for judgments of relevance and indifference? In some striking paragraphs this thesis is illustrated by the characteristics of DARWIN'S argument in The Origin of Species, where, not only in the main argument, but in many of the subsidiary discussions, an elaborate combination of induction and analogy is superimposed upon a narrow and limited knowledge of statistical frequency. "Nobody supposes," Mr. KEYNES asserts, "that we can measure exactly the probability of an induction. Yet," he continues, in lively vein, "many people seem to believe that in the weaker and much more difficult type of argument, where the association under examination has been in our experience, not invariable, but merely in a certain proportion, we can attribute a definite measure to our future expectations and can claim practical certainty for the results of predictions which lie within relatively narrow limits. Coolly considered, this is a preposterous claim, which would have been universally rejected long ago, if those who made it had not so successfully concealed themselves from the eyes of common sense in a maze of mathematics."

The pitfalls of a confiding use of time correlations are further set forth in an important paper by Mr. G. UDNY YULE, F.R.S., which appeared in the *Journal of the Royal Statistical Society* for July, 1921, and in the discussion following it. Mr. YULE points out that the essential difficulty of the time-correlation problem is the difficulty of isolating for study different components in the total movement of each variable. He considers that the method of Mr. HOOKER—"the isolation of oscillations from the trend"—is preferable, and regards the variate-difference method as distorting the actual oscillations, and never of service in dealing with movements "which are not sufficiently conspicuous to call for remark in a graph of the data." But if this be so, what advantage does this method possess over judicious inspection of a graph of the factors under comparison?

Cancer: Its Cause and Cure.

THE student, who in his stages of ward life shares the public horror of cancer, grows to regard the phenomena with less disgust as he becomes familiar with the histology. The picture of the early stage, where perhaps a few aberrant slightly atypical epithelial cells are the only signs of malignant change, inspires him with the hope that surely in his time means may be found to check the overgrowth of these almost normal tissues. Later in his career he wishes fervently to remove for his patients the mystery surrounding this dreaded disease; he wishes them to share in his knowledge, in order to ensure early consultation. The valuable bulletin of the League of Red Cross Societies, published last June,[1] was welcomed by medical men for this precise reason—it gave the patients a sound conspectus of what is known of the disease, and of what is hoped from its treatment. Whether the publication by Mr. ANDREW CHARLES[2] is likely to achieve so useful a purpose is not certain. Here we have an association of general health propaganda with the advertisement of a special fund, and the blend is perilous. With detailed information as to the pathology and prognosis of special forms of cancer there are included fuller descriptions of symptoms than can be considered necessary for lay reading, accompanied by illustrations of advanced cases which are not nice to look at. It is doubtful whether it is kind or wise to excite more horror than already exists, and whether such provocation will lead to the desired result—financial support for the Cancer Research Fund of Ireland. Needless to say, the claim made in the preface by Lord GLENAVY that "cancer can be cured" is not confirmed by the text for which Mr. CHARLES is responsible. Nor, if only in view of the recent advertisement in the public press of the large rewards offered by Lord ATHOLSTAN and Sir WILLIAM VENO to the discoverer of a cure within the next five years, will Lord GLENAVY'S statement carry conviction. If it is known that "cancer can be cured," what need is there to offer prizes for the knowledge?

As to the rewards offered, there is something almost tragic in these periodic manifestations of the helpless irritation felt by the layman who has to stand and wait for someone to discover a cure for cancer. He hears impatiently that brilliant people have investigated this difficult problem for a time, and have then turned, baffled and depressed, to the unravelling of some other problems. In so far as he desires to keep faltering attention focused the prize-offerer may be right; but if the thing that is being sought is outside the special field of research he may actually impede progress. The versatility of the scientific investigator often troubles his friends, but those who would have him devote his life to one aspect of one problem rather than allow his energies

[1] THE LANCET, 1921, ii., 347.
[2] Cancer: A Handbook for the Lay Public. Brunswick Press.

to be deflected into side issues, generally mistake the situation. If an ingenious investigator attempts to keep himself within rigid boundaries, his inspiration leaves him and his work becomes a routine. No one of those inclined to work at cancer is likely to be stimulated to still greater effort by a promise of reward; for though monetary gain is an obvious corollary of the discovery of a cure for cancer, such a cure could never be discovered to order. Knowledge of the cause need not necessarily precede that of the cure; it is true that specifics for syphilis and malaria were known for years before the causes were suspected, and an acute appendicitis of unknown ætiology is often amenable to surgical treatment. Someone might indeed stumble upon a therapeutic measure that would differentiate malignant from innocent cells even as iodine detects starch, and would kill the former while leaving the latter intact. But such a discovery would be accidental and empirical, and cannot be anticipated. Meanwhile the time of serious workers is too valuable to be wasted by multifarious demands for the testing of unlikely remedies, and this may be the only result of these well-meant offers. Endowment of general research is sorely needed; offers of reward for specific performances contain little promise.

Annotations.

"Ne quid nimis."

THE RHODESIAN SKULL.

THE most interesting anthropological find of recent years has not been very long in England. It was shown by Prof. A. Smith Woodward, soon after its arrival, at a meeting of the Anatomical Society and was then handed over to the museum authorities. Since that time it has been the subject of at least two illustrated lectures—one of these by Prof. Smith Woodward, and the other by Prof. G. Elliot Smith at a social evening of the Royal Society of Medicine on Jan. 25th. The skull is probably to be classed as of an early Neanderthal type, intermediate between the Gibraltar and the Piltdown specimens, and persisting to a later period in Africa than its correspondents in Europe. It is remarkably perfect, though the mandible is lacking, and only presents a considerable loss of substance on the right lower part. It is not fossilised but shows the actual bone, having been covered and preserved by a coating of metallic ores. It was obtained from a cave in some workings 300 miles north of the Zambesi where it was associated with innumerable animal bones partly eaten by hyenas and human bones broken in a way suggestive of cannibalism; fragments of a second skeleton were found with it in the lower part of the cave. The face is large and heavy, larger than the Neanderthal face as it is known at present, and has a decidedly anthropoid appearance, this being largely due to the great brow-ridges and large, deep, rounded orbits. The nasal region is not so distinctly marked off from the face as in the known type, suggesting that the nose during life may have approximated in some degree to a snout-like form, and there is a relatively enormous length between the nasal aperture and the alveolar margin. The palate is comparatively very large but definitely human in its characters, as are also the teeth, and it is interesting to note that the third molar is showing reduction; accurate measurements and indices are not yet, of course, available. The "human" appearance of the cranium is striking when we turn to it from the "anthropoid" face. The condyles on the base tell us that the original owner of the skull walked in the human manner, but they are not in the centre of the base, and this fact, with the heaviness of the face, is in keeping with the large muscular areas and impressions on the occipital bone. Probably the head was carried tilted back on the column, the neck and body inclining forward. The markings for the masticatory muscles do not seem to be as decided as might have been expected. The Heidelberg jaw has been fitted to the skull and has been found a shade too small, and this will give some idea of the great size of the palate region. It is interesting to note that caries of the teeth has been found, and also evidence of middle-ear disease; a small rounded perforation, evidently present some time before death, exists above the left ear. Prof. Elliot Smith exhibited an endocranial cast of the subject, comparing it with others which he showed. His detailed report on this will be awaited with the greatest interest. The preliminary observation shows distinctly the prefrontal, parietal, and temporal conditions associated with the low type of brain, and the value of an authoritative report on an absolute cast calling for no reconstruction, such as this is, will be great. It may be added that he gives the cranial capacity as 1280. If we compare this with the estimations for certain other skulls—for example, Neanderthal 1500, Brunn 1400, Galley Hill a little less—we can see the lower station of the Rhodesian skull, but it must be remembered that the Gibraltar skull is said to be only 1100.

MENTAL EQUILIBRIUM IN MEDICINE.

IN the course of his valedictory address as President of the Medico-Chirurgical Society of Edinburgh, delivered on Nov. 2nd, 1921, and published in full in the January number of the *Edinburgh Medical Journal*, Prof. F. M. Caird gave wise words of counsel concerning the cultivation by medical men of a sane scepticism in the face of new theories and propositions until the worth of the latter had been proved. There was, he said, some excuse for an optimistic credulity begotten of the humane desire to seize every chance that might be offered to alleviate pain or prolong life; but the medical profession abounded in credulous minds which ministered to a still more credulous public, and brought about an instability of trust and hope. Although in past years medical men had been, he thought, misled by flights of imagination unwittingly to hypnotise their patients and themselves into belief in some particular treatment, he, and no doubt all his audience, had had similar experiences of *ex cathedra* statements taken as gospel by ingenuous students. As an instance dating from his own student days Prof. Caird mentioned the romance of *Bathybius hæckelii*, the sheet of primordial protoplasm lining Atlantic depths, provided with hypothetical sense organs, coccoliths and coccospheres—the protoplasm which it was suggested represented the beginning of all life, which was even "recognised" in a fossil state as *Eozoon canadense*. Other examples of past treatments were that of the injection of sulphuretted hydrogen into the bowels of tuberculous patients, and that of the Apostoli "cure," with its huge Gaiffe batteries, once held to be the only safe treatment for uterine myomata; whilst during the recent war an astounding method of mapping out hæmorrhagic lesions of the brain and viscera by some so-called X ray method was put forward, only to vanish with its discoverer when the latter announced the devising of a secret method of destroying life by electrical forces manipulated from a distance. Recalling the remark of Dr. Matthews Duncan to a class that "there are more quacks in the profession than out of it," Prof. Caird passed on to contrast with the instances which he had given the abiding character of the principles formulated by Lister with regard to wound treatment, the logical simplicity of Koch's postulates, and Ricard's prophetic description of syphilis as the key to all pathology. Whilst marvelling at the foresight of the forefathers of medicine, the present members of the profession would have to be prepared for increasing change as clinical research and pathology brought problem after problem to solution; nor was there need to fear that they would ever drift into therapeutic nihilism, for whatever changes might ensue, the bonds of humanity and confidence would remain between practitioner and patient.

PSEUDO-COXALGIA.

FOR many years there has been recognised a class of cases of hip-joint disease which in some ways—more particularly in the rapidity with which there is complete restoration of function—do not quite coincide with the usual clinical picture of tuberculous arthritis of the hip. For long they were regarded as true tuberculous infections with early spontaneous recovery, and it was not till 1909 that A. T. Legg, of Boston, suggested that this was a definite clinical entity—a non-tuberculous affection. Within a short time Calvé and Perthes had established it as a separate class of hip disease in children, and they are respectively responsible for the two common names for this disease—viz., pseudo-coxalgia and osteochondritis deformans. The disease is now well known amongst those who are constantly dealing with children, but it is by no means generally recognised and understood. In particular there is some uncertainty as to the end-results of these cases, for though apparently there is complete restoration of function within a few months, yet it would seem doubtful that such joints should remain free from any trouble in later life. Mr. H. A. T. Fairbanks's note in THE LANCET a year ago evoked a lively international correspondence.[1]

The whole subject has again been investigated by Mr. Harry Platt in the Orthopædic Service of the Ancoats Hospital, Manchester, and is the subject of an article in the January issue of the *British Journal of Surgery*. The radiographic appearances are so typical that an examination of the skiagrams leaves no doubt as to the diagnosis. The head of the femur loses its spherical shape and becomes flattened in its vertical diameter; as the disease progresses the flattened epiphysis breaks up into several fragments which have an increased density. In addition the head becomes more flattened and now expands in such a way that it is no longer confined within the acetabulum, but approaches the great trochanter. Later still, although the head remains flattened, the fragments of the bony nucleus now become fused again. In the majority this represents the healed stage, and the deformed head persists throughout life, but there appears to be a small number of cases in which there is little tendency to fragmentation and in which the head returns eventually to its normal shape. Coincident with these changes in the head, the neck of the femur becomes broadened out and slightly shortened, but there is no alteration in the angle of the neck with the shaft. In addition there are frequently seen areas of rarefaction and condensation, which are more marked in the severer cases. It is most important to note that the acetabulum also takes part in the disease and its appearances closely follow these changes in the femoral head, and the final shape of the hip-joint socket is determined by the final shape of the head. With regard to the end-results of this disease there is considerable divergence of opinion, and there is no really authoritative communication on the subject. It would appear probable that, though complete restoration of function is the rule, these joints are likely to fall easy victims to trauma, chronic strain, and infection, and so become the seat of arthritis deformans.

Unluckily the consideration of the nature and causation of pseudo-coxalgia does not lead very far, and none of the theories carry complete conviction. Trauma, rickets, congenital abnormalities of ossification, syphilis, infection, and endocrinal variations are all labelled as causes. Trauma as an ætiological factor is present in many joint affections of children, and cannot be regarded as a specific factor in this disease though it may play a part. Of the remaining theories, there would appear to be no sound evidence in support of any but the infection theory. Four surgeons have explored the upper end of the femur by operation, and on two occasions scrapings from the interior of the bone revealed a growth of *Staphylococcus aureus*, a third showed a condition which Phemister described as typical of old chronic infection, probably pyogenic, and the fourth revealed to Perthes no signs of infection. The evidence seems to favour the infective theory of the causation of pseudo-coxalgia. In that there appears to be a set cycle of pathological changes, conservative treatment does little to accelerate or cut short those changes, but during the stage of prominent symptoms instrumental treatment, aimed at the elimination of weight bearing, would seem desirable. Operative procedures have no place whatsoever in the therapeutics of this disease. In conclusion, it is of interest to note that there are two conditions in which clinical and radiographic appearances are similar to those seen in pseudo-coxalgia—viz., Köhler's disease of the tarsal scaphoid, and Schlatter's disease of the tubercle of the tibia.

[1] THE LANCET, 1921, i., 20, 403, 509, 560, 1153.

PLANT ANTIBODIES.

Prof. V. H. Blackman's recent Chadwick Lecture[1] set forth very lucidly one of the striking things about plant as compared with animal diseases—namely, the absence of known cases of acquired immunity. In plant disease, he said, no substances had been detected corresponding to antitoxins, bacteriolysins, and so forth, nor was there any evidence of chemical warfare between plant and infecting organism. The cells of the host plant once entered nearly always died; the plant, therefore, resisted disease by keeping the invader out. No one, in fact, seems to have succeeded in exciting plants to produce antibodies comparable to those which are generated so easily and regularly by mammals and birds in response to the presence of foreign proteids. The experiments of C. Picado[2] with the cactus *Opuntia* are therefore of some interest. The large fleshy leaves of this plant yield liquid in abundance on pressure and they will hold fair quantities of injected fluids, so that it is not difficult to do experiments along familiar lines. Injections of rabbit red corpuscles and yeasts gave completely negative results. But when the author tried pollen grains he found that the juice of the inoculated leaves acquired agglutinating and lytic properties which were not exhibited by the juice of normal leaves. The cytolytic power was destroyed by heating to 45° C. for half an hour and restored by the addition of normal juice, as with mammalian lytic sera. The main difference found was that these plant antibodies were certainly not species-specific and their group-specificity was not very clear. The idea that plants will produce antibodies if plant antigens are exhibited is an attractive one and may yield much interesting information, though the anatomical facts of the invasion of plants by bacteria and fungi do not suggest that active immunity along mammalian lines is an important feature in plant diseases. The presence or absence of a general circulation forms a sharp dividing line.

SURGICAL TREATMENT OF PULMONARY TUBERCULOSIS.

EVERY investigator is sooner or later confronted by the question: "Shall I publish my failures?" It is illustrative of human nature that we talk of our successes and leave our failures to the delectation of our neighbours. But it is not always desirable to let others superintend the obsequies of our own still-births, and in frankly discussing in the January number of *Tubercle* the disappointments he has experienced in extrapleural pneumolysis in the treatment of pulmonary tuberculosis, Dr. H. Ulrici has shown wisdom as well as courage. Since 1918 he has attempted in several cases of total pleural adhesion, in which no intrapleural pneumothorax could be induced, to form a large extrapleural pneumothorax by the operative detachment of the lung from the chest wall. The operation requires about an hour's general anæsthesia and consists of stripping the lung from the ribs in such a way that

[1] THE LANCET, Oct. 29th, 1921, p. 935.
[2] Ann. de l'Inst. Pasteur, vol. xxxv., 1921, p. 893.

the costal as well as the parietal pleura is left adherent to the lung. Thus the operator, who explores the chest through a 15 cm. long opening running parallel with the seventh intercostal space, follows the course usually taken when, at a necropsy, the lungs are detached from the chest wall so as not to tear their substance. No rib resection is necessary apart from the excision of one or two centimetres of the cartilage of the rib above the site of operation. In some of Dr. Ulrici's cases the wound healed by first intention, and the extrapleural pneumothorax was maintained for a considerable time by injections of air. But just in those cases in which he was apparently most successful in detaching the base of the lung from the diaphragm, he was confronted by a complication which partially stultified his results. Owing to the vomiting and severe cough which follow general anæsthesia, the patient is apt to force the air out of the pneumothorax through the operation wound, with the result that the lower lobe re-expands and again becomes adherent to the chest wall. The result is a partial pneumothorax confined to the upper lobe, and the therapeutic effect is no better than with a partial intrapleural pneumothorax. Dr. Ulrici has tried to avoid this complication by substituting physiological saline solution for air, but he found this solution also escaped through the operation wound. Another serious objection to the operation is the facility it provides for sepsis; two of Dr. Ulrici's cases were complicated by a purulent effusion entailing rib resection. It is evident from this paper that extrapleural pneumolysis may represent a cosmetically attractive operation which saves the patient from the external deformities which the various plastic operations entail, but it is a heroic measure with few compensatory advantages to recommend it. As a competitor of extrapleural thoracoplasty, as practised by Prof. C. Saugman and Prof. P. Bull,[1] it seems bound to take second place.

THE ÆTIOLOGICAL SIGNIFICANCE OF CELL-NECROSIS.

IT is one of the drawbacks to the advance of thought by successive steps, instead of an even and unbroken progression, that each new idea has a phase of domination during which other ideas, bearing upon the same subject, suffer eclipse to a greater or less extent. It is, perhaps, necessary, in order that the new work may eventually attain to its proper place, that for a period it shall have an exaggerated prominence. At the present time one sometimes has an uneasy feeling that the microbic theory of disease is coming into its own at the expense of other considerations well worthy of more prominence than they at present possess. In the current teaching of the medical schools perhaps too much attention is focused upon the organism itself and too little upon its by-products and their effects. We tend, both in our pathology and our therapeutics, to let the staphylococcus too largely dominate our mental picture of suppuration, and thus we give insufficient heed to results which are due rather to the absorption of products set free in the evolution of the staphylococcus, and which are therefore derived from the body cells themselves, than to the life-processes of the organism as we see them in the test-tube. Ubi pus ibi evacuo. Yet the evacuation which often results in such striking amelioration of symptoms does not get rid of the staphylococcus, it only completes the slower surgery of the body itself. The chief necessity, at this stage, is not so much a sterilisation of the infected area as a removal of the products of the defensive process, which have served their turn and are now an encumbrance and a source of disease themselves.

It is only by the clamour of extremists that the moderate men reach to reform; and though not by any means agreeing with the full development of his thesis we appreciate the recent address delivered by Dr. Fenton Turck at Guy's Hospital Medical School, as a welcome corrective to our present tendency to a too purely microbic conception of disease. Dr. Turck is an extremist, and for him all ills to which the flesh is heir are manifestations of intoxication produced by the products of cell-necrosis within the living subject. This is a view which he has sustained and developed over a period of some 25 years, and in the course of his experimental work he has realised the importance, now universally allowed, of the products of damaged tissues as ætiological factors in the production of surgical shock. It has been abundantly proved that the lowering of blood pressure, which we to-day believe to be the essential fact in shock, can be produced by allowing the juices from damaged tissues, and in particular muscle, to gain access to the circulation. Dale has recently produced a like result with histamine, and believes it due to a localised action upon the capillaries. Dr. Turck's work in this direction has not, we believe, received much recognition. Shock sprang into great general prominence during the war, and the disturbed condition of scientific work during that period perhaps led to this oversight. We cannot but feel, nevertheless, that the author's insistence upon the further development of his theory of tissue toxin carries us into conceptions which we are not prepared to accept and, in our opinion, rather detracts attention from his interesting work on shock. Among other views which he holds is that of the identity of surgical and anaphylactic shock. We find it difficult to accept the statement that the active factor, produced in damaged tissues and giving rise to shock, can be obtained from the ash of incinerated tissues and, a fortiori, that such a product is itself capable of producing anaphylactic shock, which the constant experience of a host of observers goes to show is generated by protein substances only. Neither can we accept the view that diseases are mere phases of such auto-intoxication, whose identity depends upon the concentration and duration of action of the toxic substance. This return to views akin to those of Brown and Broussais is terrible heresy in these days of specific intoxication, and it says not a little for the courage of their originator. As we have already indicated, there is much that is both refreshing and stimulating in Dr. Turck's theme, and though we do not accept his views we find ourselves more on common ground when he says that "the architecture of the theatre of life is only of interest as the structure wherein the biological drama is played." Though a pupil of Virchow, he will agree with us that Cohnheim had a truer conception of pathology than ever the morbid anatomist had.

RECURRENT RENAL CALCULI.

Dr. J. D. Barney has recently published[1] an important paper on the recurrence of renal calculi after operation—a subject which has received little attention. The only previous articles of any value on the subject are those of Cabot and Crabtree and of Braasch, all American writers. The use of the X rays enables the diagnosis of renal calculus to be made with a precision previously impossible. The results of the investigation as regards recurrence are profoundly unsatisfactory. Cabot and Crabtree, in 51 per cent. of their cases of pyelotomy, found stones subsequently in the kidney. Dr. Barney holds that in many of these cases the stones were overlooked at operation, but admits, also, that recurrences are numerous. This is a point which can be settled only by the use of the X rays during convalescence. Braasch reports more favourable results from the Mayo Clinic—recurrence in only 14·7 per cent. But he does not state the operation which was performed or whether the patients were examined with the X rays by himself or some equally competent observer. Dr. Barney has analysed 139 cases of renal calculus occurring in the genito-urinary department of the Massachusetts General Hospital—108 in men

[1] THE LANCET, 1920, ii., 778.

[1] Boston Medical and Surgical Journal, Jan. 5th.

and 31 in women. In the cases of pyelotomy he found "recurrence" in 32·8 per cent. It might be thought that in nephrotomy, an operation which fully exposes the kidney to the finger and eye, the results would be better. But Cabot and Crabtree found recurrence in 56 per cent. of the cases of this operation, a higher percentage than after pyelotomy. In Dr. Barney's series stones were found in the kidney after nephrotomy in 30·3 per cent. of the cases. This high percentage of "recurrence" is a serious matter, as a second operation on the kidney endangers not only the kidney but the patient. Why is the removal of stones from the comparatively small cavity of the renal pelvis not always possible? There are many reasons. The pelvis is a very complex cavity with various ramifications in the form of calyces, which often branch off at right or acute angles. A probe may fail to pass into a calyx, either because of its minute size or its location. The manipulation required for removing a stone causes hæmorrhage which leads to clotting, and the layer of fibrin deposited prevents detection of a stone by a metal instrument. Occasionally during operation a stone slips unobserved into a dilated ureter or even into the perirenal tissues. For the avoidance of "recurrence" Dr. Barney makes a number of recommendations. A radiogram should be taken as near as possible to the time of operation, preferably on the same day, for the stone may move. Care should be taken to avoid bleeding. Needling the kidney at the suspected locality is often useful. The procedure of Caulk of St. Louis—gently tapping the kidney to shake the stone out of the calyx—has proved useful. Care should be taken to avoid fracture in extracting the stone. The use of the fluoroscope in conjunction with the operation, a method seen in several American hospitals, offers great possibilities. There are cases in which it is not possible to remove all the stones from a kidney, but failures will be reduced in proportion to the care taken before and during operation.

PRIMARY SCLEROSIS OF THE PULMONARY ARTERY.

CASES where sclerosis of the pulmonary artery is found may be divided into three groups: (1) Where it occurs in subjects which have generalised arteriosclerosis; (2) in subjects who have increased pressure and chronic stasis of the lesser circulation from congenital or acquired heart disease, or grave pulmonary and pleural lesions such as emphysema, fibrosis, or pleural adhesions; and (3) primary sclerosis, isolated and independent of any changes in the heart or lungs. Dr. G. Mattirolo of the Ospedale Maggiore, at Turin, has collected 19 such cases, including one under his own observation.[1] A perusal of these shows that there exists a special form of sclerosis of the pulmonary artery, characterised by the diffusion of the process throughout the whole, or nearly the whole, of the pulmonary arterial system, by marked narrowing and obliteration of the smaller branches, and by tendency to dilatation of the larger and of the trunk itself. This form does not appear to be secondary to cardiac, pulmonary, or pleural affections, but essentially primary. Changes in the heart and general circulation are the direct consequences of the diffuse contraction of the pulmonary arterial tree. The hypertension which is set up in the lesser circulation in consequence of the stenosis of the small pulmonary vessels, gives rise to a progressive compensatory hypertrophy of the right ventricle, and later on, when resistance is increased, to dilatation of the right ventricle and tricuspid insufficiency with signs of failing compensation. The production of emboli, which presumably take their origin from degenerated atheromatous patches or from thrombi formed in the larger branches, may give rise to infarcts in the lungs with the clinical and anatomical signs peculiar to them. This affection seems to occur in relatively young persons, and the clinical picture shows a complex of constant and characteristic symptoms. These symptoms, however, while faithfully reflecting the anatomical changes in the organs, are not sufficient to establish a diagnosis, since they merely represent the ordinary signs of failing compensation. Cyanosis, sometimes of striking intensity, is the one symptom which has struck the attention of observers. It is therefore on this symptom that the suspicion of pulmonary arterio-sclerosis may be founded when conditions are present which permit the exclusion of a valvular lesion, a congenital malformation, or an endocarditis. The inconstancy and variability of auscultatory signs in the heart in various cases do not offer any guide to a differential diagnosis.

[1] Archivio per le Scienze Mediche. Vol. xliv., 1921, No. 7. Turin.

BACTERIOLOGY OF PNEUMONIA.

ACCORDING to Dr. Arthur Bates Lyon[1] of Boston, U.S.A., the relative mildness of lobar pneumonia in childhood may be explained by one of two hypotheses: either the great majority of the cases are caused by less virulent strains of pneumococci, or the incidence of fixed types being much the same as in the adult, the child presents a greater natural resistance than the average adult. In order to determine which of these two hypotheses was correct Dr. Lyon carried out bacteriological investigations on 165 children up to the age of 12 years admitted to the pneumonia service of the Boston City Hospital, 98 of whom were suffering from lobar pneumonia, 52 from broncho-pneumonia, and 15 from post-pneumonic empyema. The studies were based on sputum examinations, blood cultures, cultures from pleural fluid, or from the lung itself, and in rare instances from the spinal fluids. The sputum was obtained by introducing a sterile rubber catheter (No. 18 or 20 French) against the patient's pharyngeal wall so as to obtain sufficient sputum to fill the eye of the catheter. The results of the investigation were as follows: in lobar pneumonia or empyema following it, pneumococcus Type I. was found in 29·9 per cent., pneumococcus Type II. in 3 per cent., pneumococcus Type III. in 7·1 per cent., and pneumococcus Type IV. in 37·7 per cent. These findings corresponded fairly closely with those in a parallel series of 151 cases of lobar pneumonia in adults admitted to the hospital during the same period. Dr. Lyon concludes that not only are the results obtained in children fairly accurate, but also that the ætiology of lobar pneumonia in infants and children closely follows that in adults in a given place and season. The greater natural immunity of the child to the infecting type of pneumococcus was shown by the comparative mortality in adults and children. In Type I. the percentage in adults was 30, and in children 7·9; in Type II. in adults 16·6, and 0 in children; in Type III. 75·0 in adults and 0 in children; and in Type IV. 10·8 in adults and 5·7 in children. In broncho-pneumonia the fixed types of pneumococcus were found to be much less common than in lobar pneumonia, while common mouth forms were much more frequent. The extraordinary tendency to the development of empyema in infections with pneumococcus Type I. is shown by the fact that nearly 38 per cent. of pneumonias due to this type developed this complication.

[1] American Journal of Diseases of Children, January, 1922.

PRIMARY CARCINOMA OF THE URETER.

IN a recent article on primary carcinoma of the ureter Dr. Edward S. Judd and Dr. John E. Struthers,[2] of the Mayo Foundation, who have collected 25 cases from the literature, with the report of a personal case, state that Albarran in 1896 was the first to diagnose a case correctly before operation. In only four, or 16 per cent., of the recorded cases could calculi be regarded as an ætiological factor. Seventeen of the cases were adeno-carcinoma and medullary carci-

[2] Journal of Urology, August, 1921.

noma, and eight papillary and simple epithelioma. The tumours usually occur between the ages of 40 and 60. As in tumour of the kidney, the principal symptoms are hæmaturia, swelling, and pain. The hæmaturia, which is usually the first symptom, generally comes on without cause, the blood being profuse and thoroughly mixed with the urine. If there is clot formation the pain may be intense and colicky. Usually there is vesical disturbance, which is shown by frequent micturition. The bleeding may be intermittent, and may last for months or years. Pain may or may not be present. In most cases it was noted as the principal symptom at some time during the course of the disease. The urine may contain red cells, ureteral epithelium, atypical cells, and fragments of tumour. Pus will also be present if infection takes place, and pyelonephritis or pyonephrosis, with rise of temperature, will develop. Hydronephrosis has been found in 10 patients, or 40 per cent. On cystoscopic examination the bladder and ureteral orifices may appear normal, or there may be an inflammatory reaction shown by a ring of œdema, with or without erosion, around the orifice, or distortion of the orifice. Fifteen of the 25 cases were operated on, and eight recoveries were reported, but the time after operation was too short definitely to determine the final prognosis with regard to recovery or metastases. In the case reported by the present writers, which occurred in a man aged 48, who had suffered from hæmaturia and pain at the end of the penis for two years, cystoscopic examination showed left hæmaturia with obstruction at the meatus, neoplasm, and stone. Nephrectomy of the left kidney was performed, 80 per cent. of its substance being destroyed, and was followed 11 days later by left ureterectomy, with resection of an area measuring 3·5 cm. by 3·5 cm. of the bladder wall. On section of the ureter a definite papillary epithelioma was found occupying the lower 8 cm. of the duct. The patient was discharged in good condition a month after the operation.

LYMPHOBLASTIC ERYTHRODERMIA.

IN an interesting paper recently published[1] Dr. J. H. Sequeira and Dr. Philip N. Panton describe three cases of what they believe to be a specific disease of unknown ætiology to which they have given the name of lymphoblastic erythrodermia, as indicating its essential characteristics. The three cases were those of a man of 60, a man of 40, and a woman of 64, with no history or evidence of venereal disease. Each case gave a somewhat similar history of a red patch beginning on the shoulders or hands and face about two years previously without any symptoms of illness, the eruption, which was extremely irritable, gradually spreading over the whole body. In one of the cases the cervical, axillary, and inguinal lymphatic glands were enlarged and movable, but not painful or tender; in the other two cases there was little or no enlargement of any of the lymphatic glands, nor was there in any of the cases enlargement of the spleen or liver. The blood picture was more or less constant, showing a moderate leucocytosis (8000 to 30,000 leucocytes per c.mm.), the increase being mainly in the lymphatic count, which ranged as high as 76 per cent. Myeloblasts were practically absent. The changes in the red cells and hæmoglobin were unimportant, except later on in the first case when a considerable degree of secondary anæmia was present. No special morphological changes were found in the erythrocytes, nor were any nucleated red cells present. The authors emphasise the fact that the blood picture was sufficiently distinctive both to exclude a diagnosis of leukæmia and of so-called pseudo-leukæmia, and also to differentiate it from other erythrodermias, including mycosis fungoides, from which the disease also differed in the histology, in the absence of a tumour stage, and in its failure to respond to X ray treatment. A condition at first sight somewhat similar was described under the name of erythrœdema by Dr. H. Swift, of Adelaide, in 1914, and by Dr. A. J. Wood, of Melbourne, in 1921, the former having seen 14 cases and the latter 40, all occurring in children from 3½ months to 3½ years of age. The associated symptoms are, however, dissimilar, presenting a totally different clinical picture, and while no blood counts appear to have been done in Dr. Wood's cases, in those of Dr. Swift no cytological abnormality whatever was detected, except a slight diminution of the number of red blood corpuscles in one case. A case closely resembling the three now brought forward was described by von Zumbusch in 1917, but Dr. Sequeira is of the opinion that the condition may be more common than would appear from the literature to be the case.

[1] British Journal of Dermatology and Syphilis, December, 1921.

Sir Robert Jones has succeeded the late Sir Arthur Pearson as President of the Association of Certificated Blind Masseurs.

Dr. F. Foord Caiger, chief medical officer, Infectious Hospitals Service of the Metropolitan Asylums Board, and medical superintendent of the South-Western Hospital, Stockwell, has been appointed emeritus physician to St. Thomas's Hospital.

AT the Royal College of Physicians of London Dr. Major Greenwood will deliver the Milroy lectures on March 9th, 14th and 16th, taking as his subject the Influence of Industrial Employment on General Health. The Goulstonian lectures on the Interpretation of Symptoms in Disease of the Central Nervous System will be given on March 21st, 23rd, and 28th by Dr. A. Feiling. Dr. Hector Mackenzie delivers the Lumleian lectures on Diseases of the Thyroid Gland on March 30th, April 4th and 6th. The hour in each case is 5 P.M.

AT the Royal College of Surgeons of England, the series of Hunterian Lectures will be concluded next week. Feb. 6th: Prof. Alan H. Todd on Orthopædic Aspects of Rheumatoid Arthritis. Feb. 8th: Prof. A. G. Timbrell Fisher on the Pathology and Ætiology of Osteo-arthritis. Feb. 10th: Prof. C. A. Pannett on Hydronephrosis. In the following week three Arris and Gale Lectures will be delivered: Feb. 13th, on the Nerve Supply of the Parietal Peritoneum, by Prof. V. Zachary Cope; Feb. 15th, on Colour Vision, by Dr. F. W. Edridge-Green; Feb. 17th, on Current Views on Internal Secretion, by Prof. Swale Vincent. The hour in each case is 5 P.M.

INDEX TO "THE LANCET," VOL. II., 1921.

THE Index and Title-page to Vol. II., 1921, which was completed with the issue of Dec. 31st, is now ready. A copy will be sent gratis to subscribers on receipt of a post-card addressed to the Manager of THE LANCET, 1, Bedford-street, Strand, W.C. 2.

UNIVERSITY OF PARIS: POST-GRADUATE COURSE IN DISEASES OF THE LIVER, &C.—Prof. M. A. Gilbert, with the assistance of MM. Maurice Villaret, Henri Bénard, Deval, Herscher, Chabrol, Saint Girons, Jomier, Dumont, Descomps, Maréchal, Brin, Coury, Lippmann, and Okinzyc, will hold a post-graduate course on diseases of the liver, biliary tract, and pancreas, and on diabetes, beginning on April 10th, 1922, at the medical clinic of the Hôtel-Dieu. The course will consist of 34 lectures and will last for a fortnight; lectures will be illustrated by lantern slides, and specimens will be shown. Special attention will be paid to clinical examination of patients and to the most modern methods of treatment. A certificate from the Faculty of Medicine of the University of Paris will be given to medical men who have completed the course. Medical men and students who wish to attend should write to the Secretary of the Faculty of Medicine, University of Paris.

PLAGUE, CHOLERA, AND TYPHUS IN TURKEY AND ADJOINING COUNTRIES.

A TWELVE MONTHS' RECORD.

BY F. G. CLEMOW, C.M.G., M.D.,
BRITISH DELEGATE, INTER-ALLIED SANITARY COMMISSIONS, CONSTANTINOPLE.

Constantinople, Nov. 8th, 1921.

IN a series of letters, published respectively in THE LANCET of Nov. 20th and Dec. 11th, 1920, and Jan. 22nd, 1921, I gave a brief summary of the facts—so far as they had become known here—respecting the prevalence of plague, cholera, and typhus fever in Turkey and some adjoining countries between the outbreak of war in 1914 and the end of October of last year. In the present papers I propose to put on record the further history of those diseases in the same regions during the past 12 months, adding also some supplementary information concerning the earlier period which has since become available.

I.—PLAGUE.

In Constantinople, where, it will be recalled, plague had reappeared in April, 1920, the disease lingered in sporadic form until Dec. 17th, when the last case was isolated. In all, 64 cases, with 32 deaths, were registered. (In 1919 the cases had numbered 54 and the deaths 24.) The cases were scattered through many parts of the city, and one well-marked "foyer" formed in a large barracks at Haidar Pasha, on the Asiatic side of the Bosphorus. Some imported cases also occurred on a Russian steamer which arrived in Constantinople on Nov. 16th, 1920; this vessel came from the Crimea, where there was no reason to believe that plague existed; but on a previous voyage she had called at Batoum, where the disease was known to be present.

In the present year (1921) there has again been a mild recrudescence of the disease in this city. On July 11th a case was removed from the Top-hané quarter of Galata, and on July 23rd another case occurred in the Tahta-kalé quarter of Stamboul. Subsequent cases have come mainly, though not solely, from these two quarters. Thirteen cases in all have been registered in the last four months, with six deaths. The sporadic character of the outbreak is thus clear; and the fact goes far to justify once more the statement that this far from sanitary city rarely, if ever, gets the epidemics it deserves.

At Smyrna, it will be recalled, plague cases occurred in 1918, 1919, and 1920. In 1920 the recrudescence began on July 17th, and what was thought to be the last case was reported at the end of October; an isolated case, however, occurred on Dec. 25th. In the present year cases were seen on May 6th and 10th; single cases followed in the weeks ending June 25th, July 9th, 16th, and 23rd, August 27th, Sept. 3rd, and one case (bills of health say two cases) on Oct. 20th. In addition, one case occurred on a steamer arriving in Smyrna from Scala-Nova on August 23rd. At Scala-Nova itself, at no great distance from Smyrna, plague appeared on Oct. 3rd, 1920, and between that date and Nov. 25th 19 cases, with 9 deaths, were recorded; in addition, there were 2 fatal cases among Italian troops stationed there. At Vourla, close to Smyrna, 1 case occurred on Dec. 17th, 1920; and at Sokia, in the same region, there were 6 cases, with 3 deaths, between Oct. 4th and 24th, 1920, and also 4 cases, with 3 deaths, among Italian troops stationed there. Neither Scala-Nova, Vourla, nor Sokia have been mentioned in this year's reports.

At Beirût plague reappeared on June 4th, 1920, and between that date and Jan. 4th, 1921, 39 cases were reported. These were distributed as follows: 3 in June, 10 in July, 3 in August, 2 in September, 7 in October, 4 in November, 9 in December, and 1 in January. The disease became active again at the end of May, 1921; 1 case occurred on May 31st, 2 in June, 8 (and 1 suspected case) in July, 14 (and 1 imported case, on a ship from Constantinople and Smyrna) in August, 8 in September, and 10 in October; making a total for this year of 43 cases.

The disease has also been present in other parts of Syria during the past summer. At Alexandretta single cases occurred on June 18th, 20th, and 22nd; there were 8 cases in July, 1 on August 5th, and 1 in the week ending Oct. 8th. At Caiffa there were 2 cases and 1 suspected case on July 29th. At Jaffa 1 case was seen on Oct. 11th, at Habda 1 case on July 5th, and at Kermet-Shahwan, in the Lebanon, 1 case on August 23rd. At Adalia, on the south coast of Asia Minor, single cases were seen on July 25th and August 2nd, 1920, and some cases seem to have occurred before Sept. 7th of this year. At Mersina, on the same coast, single cases were recorded on August 23rd and 26th, and Sept. 10th, 1920.

Greece and the islands of the Ægean, which in earlier times were rarely attacked by plague, have not escaped in the last two years. At the Piraeus a case of the disease was seen on June 20th, 1920, and this was followed by 4 cases in July, 6 in August, 5 in September, 1 on Oct. 21st, 2 between Oct. 23rd and Nov. 5th, and 1 on Nov. 19th; making 20 cases in all. In the present year 1 case occurred on August 29th, followed by 6 in September and 4 in October, a total to date of 11 cases. In Athens 1 case was registered on Sept. 29th, 1920, 1 on Oct. 8th, and 4 between Oct. 23rd and Nov. 5th. None have been reported from the Greek capital this year. In Salonika 2 cases were seen on Sept. 18th, 1920, 2 on the 25th, and 1 on the 29th. The information received here from Salonika (and also from other places in Greece) has been far from complete, and in February last it was authoritatively stated that "several cases" had occurred among Greek refugees from Transcaucasia interned in camps in and near that port. About the same time a French army surgeon reported that six cases had undoubtedly occurred among such refugees in a camp at Mikra (close to Salonika) in the last week of January. No official report of these cases has been received here from Greek authorities.

At Cavalla 3 cases of plague occurred in July, 1920, 2 in August, and 1 between Sept. 13th and 19th. At Zante 2 cases occurred on July 17th, 1920, 2 on July 29th, and 3 in the week ending Dec. 25th. A consular official in that island further stated in January last that, though not officially recognised, there had been about 30 cases of plague there in the week ending Jan. 16th; all the cases were said to have been of a very mild form, and the consular statement has never been officially confirmed. At Nauplia there were 2 cases on August 13th and 2 on August 24th, 1920. At Chios 1 case occurred on Oct. 8th, 1920. An official telegram from Athens, dated Dec. 18th, 1920, affirmed that no case of plague had been seen in Greece for a month, "with the exception of some suspected cases at Messini," a town in the Peloponesus, of which Galamata is the port. Finally, in the present year several cases, with 2 deaths, were reported as occurring in Rhodes in the week ending Sept. 14th.

Information respecting the occurrence of plague in South Russia has been very incomplete and uncertain. The outbreak of the disease in Batoum in 1920 was said to have come to an end at the beginning of November; the total number of cases was estimated at between 90 and 100, and that of deaths at about 40; 1 case also occurred at Poti. There have been persistent rumours of the prevalence of plague in Astrakhan during the past summer. A Russian medical official in Constantinople has stated that on June 9th news came from a Helsingfors source, to the effect that plague had appeared in the region to the east of the famine districts, the centre of the epidemic being on the Volga, and that this was confirmed by the Council of the People's Commissaries. The latter were said to have added that the epidemic was spreading rapidly, especially at Astrakhan, where 25 to 30 persons were said to be dying daily. Astrakhan was said to be surrounded by Red troops and cut off from the world, and this no doubt accounted for the absence of

authentic news of what was occurring in that town. It would be of interest to know whether this epidemic is in any way connected with those endemic centres of plague, often causing local epidemics, in the Kirghiz steppes and in the regions round the north end of the Caspian Sea, which were frequently mentioned in my letters to THE LANCET in former years.

From the foregoing summary, which is probably incomplete, and to which might be added the persistence of sporadic plague in some of the Egyptian ports, it will be seen that the disease has been somewhat widely spread through the Near East, without however giving rise in any one place to a very severe or alarming epidemic.

(To be continued.)

LUNACY ADMINISTRATION.

FURTHER OBSERVATIONS ON THE CONFERENCE ON LUNACY ADMINISTRATION OF JAN. 19TH AND 20TH.

THE attendance at Spring Gardens, in the London County Council building, consisted of the chairmen of the visiting committees and medical superintendents of the mental hospitals in England and Wales, and of delegates from the registered hospitals and the large licensed houses. Probably never before has any gathering of persons concerned in the management and control of mental hospitals been so complete. Sir ALFRED MOND, Minister of Health, presided for a short time in the opening session, and afterwards Sir FREDERICK WILLIS, chairman of the Board of Control, presided. The leading article in THE LANCET last week has drawn attention to the importance of proceedings which require more detailed notice, while a verbatim report of the proceedings will be issued later for public information.

The general impression left is that the interchange of opinion, the opportunity of meeting others interested in the same subject, and the informal discussions which took place in the lobby, all contributed to a better understanding of other persons' points of view and contributed to the common interests of all. There is no doubt that the position of the Board of Control was greatly strengthened as a result of this conference. The members of this Board joined in the discussion on exactly the same terms as any of the other speakers, and spoke in a manner which convinced all that they realised clearly the difficulties of the situation. Their earnest desire to promote the interests of the insane was particularly noticeable in the discussion on the nature of the supervision for the proposed institutions for the

Treatment of Early Incipient Cases.

It was clear at first that there was some difference of opinion. Alderman MCTAGART and several others spoke of the importance of keeping these proposed institutions entirely free from any reproach of insanity, and said that even visiting committees of asylums should have nothing to do with them, and that they should be wholly divorced from the existing mental hospitals. As the discussion proceeded it was generally admitted that some kind of supervision was necessary, and at last it was unanimously agreed that it was undesirable to establish two boards dealing with similar matters, and that it was quite for the best that the Board of Control should be the supervising body. This discussion on the early treatment of mental disorders took the whole of the first morning and was even then not quite finished.

Dr. H. C. BOND did much to clear the situation by pointing out special difficulties, and asked whether it was intended that there should be any powers of detention over those patients who, after entering homes that might be established for persons suffering from temporary maladies, wished to leave before they were considered fit. It was pointed out that there was nothing to prevent voluntary homes from being established now, but that the difficulties arose when persons were too confused in mind or too mentally disordered to be able to exercise volition. How long were such cases to be regarded as "early," and what if any, limitation was to be placed upon their freedom of movement?

Dr. E. GOODALL urged strongly the importance of establishing clinics and deprecated any temporary compromise. Several speakers spoke as to the difficulty of expense. Dr. BEDFORD PIERCE gave an account of two institutions established by the Committee of the Retreat, one at York and one at Scarborough, and referred to the useful work that had been done; he pointed out the difficulties in relation to expense and the unsuitable cases that were sent for treatment, and the anxiety which the care of borderland cases involves. Dr. T. S. GOOD spoke of the work that had been done at Oxford, and Dr. SHAW BOLTON of the work at the out-patient department at Wakefield. The discussion, though it did not reach any very definite conclusion in respect of details, undoubtedly did much to elucidate the difficulties, and finally a unanimous decision was come to, urging the establishment of institutions for the treatment of early cases without certificates, with a rider recommending that such institutions should be under Government supervision, and that the body to exercise this supervision should be the Board of Control.

Voluntary Boarders.

The next item discussed was the admission of voluntary boarders in our public mental hospitals. Dr. J. MIDDLEMASS, who was unable to be present through illness, sent a communication which was read, and its convincing nature was expressed when at the conclusion there was a general cry of "Agreed," and the subject passed on to the next item on the programme.

The Position of Medical Superintendents and Assistant Medical Officers.

An interesting discussion took place on the position of the medical superintendent and the danger of administrative duties interfering with his medical work. Dr. M. A. ARCHDALE, in introducing the subject, stated that this was a real danger and that there was a tendency for medical superintendents to become less and less interested in the progress of medicine and the medical needs of their patients and more and more engrossed in administrative duties. He stated that the visiting committees were naturally far more interested in matters which kept down expense, and knew little of the patients and their treatment. It was interesting to observe that there was no doubt whatever on the part of the conference that the medical superintendent should remain the administrative head; the phrase "Captain of the Ship" was frequently used, but this did not seem in the opinion of those present in any way to justify his neglecting his medical work. Dr. BOND pointed out that the medical superintendent could do as much medicine as he chose, and that he had the opportunity of delegating his duties, professional or administrative, as appeared desirable. Several suggestions were made as regards establishing medical secretaries to assist the superintendent in administrative details, but there was no general consensus of opinion as to what was the best way of meeting what was a real difficulty.

The question of study-leave and the status of the assistant medical officers was discussed at considerable length. The difficulty of finding medical officers was emphasised; here the importance of the Diploma of Psychological Medicine was generally recognised, but several members present deprecated insistence upon the holding of this diploma, especially by those who were commencing this branch of medical work. Dr. R. EAGER, speaking as probably the only assistant medical officer present, referred to the extreme importance of giving opportunities for further training in psychological medicine, and stated that he felt quite sure that if any visiting committee

advertised that facilities would be given for study leave, so that the diploma could be obtained after appointment, there would be a much greater probability of receiving suitable applications when vacancies occurred.

Nursing Homes and Qualifications.

With reference to the nurses, the discussion was in the first place ruled out at the suggestion of Alderman McTagart, who stated that the question of hours and the qualifications of nurses was under consideration by a conciliation committee and that any discussion on the subject might prejudice the issue. At a later meeting of the conference the matter was reopened; several speakers objected to matters of this kind being settled by the Mental Hospitals Association, and asked that the conference should be fully informed as to what was proposed. It was, however, too late for any proper discussion of this important question. Dr. WOLSELEY LEWIS spoke as to the extreme importance of effective training, and said that mental nursing was one of the highest, if not the highest, branch of the nursing profession, and that mental nurses appeared to be inadequately represented on the General Nursing Council. Dr. BEDFORD PIERCE referred to the work of the Medico-Psychological Association in the past, and said that it was proposed by the General Nursing Council to continue on the same general lines in the future. He spoke of the importance of visiting committees taking a greater interest in the work of the general nursing staff, and the need for improvement of the general conditions of service: mental nurses, he added, deserved a greater recognition for their services to the community than they had hitherto received.

The Problem of Diet.

With respect to the dietary of the institutions, Dr. R. W. BRANTHWAITE spoke of the need of careful study of modern researches in respect to accessory food factors. Dr. Branthwaite pointed out that three important principles must be borne in mind: First, there should be sufficiency of food; secondly, there should be a variety; and thirdly, that the accessory food factors must be present; a great many dietaries were deficient in the fat-soluble A and the water-soluble B. The question was asked whether the Minister of Health possessed any powers to compel visiting committees to supply adequate food to patients. The answer was that there was no such power, and that local authorities would resent interference of this nature. The very occurrence of the question seemed to suggest that there was need of considerable improvement in certain directions. Dr. MENZIES spoke of the difficulties they had had at Cheddleton in improving the dietary of the patients on account of the expenses involved. An unbiased visitor to the conference might have gone away with the impression that there was something wrong with the dietary of patients in some of our public mental hospitals.

Special Points.

Classification.—A good deal of discussion took place on the classification of patients in mental hospitals, but no very clear conclusion was reached.

Public Confidence.—Dr. H. DEVINE spoke of the importance of obtaining the confidence of the public in public mental hospitals; more money was needed and here the public must be more generous. It was desirable to scrap a good many of the rules. Dr. Devine dwelt upon the great importance of work therapy, and maintained that there was no doubt that patients had been allowed to sink into dementia from failure to take sufficient trouble with them in relation to their occupations. He said that the work should not be done in relation to its utility to the institution, but in relation to its benefit to the patient.

Women Assistant Medical Officers.—Some observations took place as to the advantages of women assistant medical officers. Dr. MOORE spoke of their great value but in a somewhat limited sphere. Others claimed that they could take a share of the work equal to men; it was generally agreed that women medical officers are necessary in our mental hospitals.

Visiting Specialists.—It was interesting to hear of the extent to which visiting specialists have been employed in our hospitals throughout the country. The value of the dentist, the ophthalmologist, the physician, and the surgeon were all spoken of, and the desirability of reinforcing the resident medical staff by expert opinion was generally approved.

Conclusions.

These observations only cover a small part of the subjects discussed during the period of about ten hours on two successive days. The impression left was that the authorities of hospitals were earnest in their endeavours to provide effective treatment for the patients. There can be little doubt that this opportunity of ascertaining what is done in other departments will have a very useful effect throughout the kingdom. It was pleasing to hear from the chairman of the Board that other conferences would be held from time to time. Backward institutions will in this way receive assistance from progressive ones.

Although criticisms were freely expressed as to present methods no visitor to the conference could find ground for the complaint that the responsible authorities were not alive to their responsibilities. There is at the present time a very healthy and widespread interest in this subject, and it is satisfactory that the Board of Control have recognised this by calling together this conference.

CONTROL OF VENEREAL DISEASE.

THE CAMPAIGN IN SCANDINAVIA.

IN *Tidsskrift for Den Norske Lægeforening* for Nov. 1st and 15th, and Dec. 1st, 1921, Dr. K. GRÖN, who represented Norway in the conference held in May last year in Copenhagen under the ægis of the Red Cross League, discusses the various measures which the four Scandinavian countries have lately adopted in the campaign against venereal disease.

Sweden.

Much of what he has to say has already been discussed in our columns,[1] but several of the points he makes are new as well as interesting. His most striking news is that, although the new Swedish law of 1918, directed against venereal disease,[2] has been in force for only a short time, there has been a remarkable reduction in the incidence throughout the country. In 1919 the incidence of venereal disease was 51·6 per 10,000 inhabitants throughout Sweden, and 229 per 10,000 in Stockholm. In 1920 these figures were reduced respectively to 34 and 144. And this does not, apparently, tell the whole story of the decline of venereal disease in Sweden, for the system of notification recently introduced has inevitably brought to light more cases than heretofore.

The teaching of venereal disease in both graduate and post-graduate courses seems to be of a high standard in the Scandinavian countries. In Sweden students are given a two-months' course at the large St. Göran's Hospital in Stockholm. This is followed by a fortnight's course of practical instruction at the Karolinska Institut in Stockholm. More than 100 doctors have taken post-graduate courses at St. Göran's Hospital, which is the chief training centre for specialists in venereal diseases. Almost all such specialists have worked as assistant physicians at this hospital for at least two years, and many for four. It is interesting to note in this connexion that the Swedish Medical Association does not allow any of its members to practise as specialists without at

[1] THE LANCET, 1920, ii., 670.
[2] THE LANCET, 1919, ii., 593 and 1164.

least one year's training in a special department. With regard to the institutional treatment of venereal disease, Sweden has long since abandoned the separate hospital system, which brands patients with an undesirable stigma, and every public hospital in Sweden, as well as in Denmark, is bound to admit cases of venereal disease. With a population of about six millions, Sweden has 85 public hospitals with a total of 12,616 beds, and it is calculated that the provision of beds for cases of venereal disease is quite adequate.

Much of the treatment is carried out free of all charge under ambulatory conditions either at the out-patient departments of the large hospitals or at dispensaries under the care of specialists. The new law of 1918 enacts that every town with a population of more than 20,000 shall provide adequate polyclinic treatment, the local authorities paying the cost of administration, while the doctors are paid by the State. In Stockholm alone there are four such large polyclinics with a staff of 12 doctors. Altogether 10 Swedish towns are now provided with polyclinics, which employ 29 medical officers with salaries ranging from 2000 to 9000 kronor. The hours for attendance are arranged to suit the patients, and precautions are taken to make the polyclinics easily accessible without their functions being given undesirable publicity. The consultation hours are at midday and in the evening—i.e., at times when workers are not employed. At the St. Göran polyclinic in 1920 there were 16,841 attendances by men and 18,825 by women.

Provision has also been made for free treatment by doctors not attached to the polyclinics; this has not proved altogether satisfactory, as in some districts the extra-polyclinic doctors get too much work, while the polyclinics are neglected in spite of being staffed by specialists. It is, therefore, probable that changes will shortly be made in this arrangement. Wassermann's test is carried out free of charge at the public laboratories in Stockholm and other large towns, and microscopic examinations are undertaken for those doctors who do not feel competent to undertake them themselves. A special feature of the campaign against venereal disease in Sweden is the Welander system for the care of the subjects of congenital syphilis. In 1900 Prof. Edvard Welander opened his hospital for these children with a view to protecting other persons from infection, providing constant medical supervision and systematic specific treatment, and saving local bodies the cost involved in the care of idiots and persons rendered blind or deaf and dumb by neglected congenital syphilis. This Welander system has since been adopted both in Denmark and Norway.

Denmark.

In Denmark the education of the medical student in venereal disease includes a special course at the dermatological and venereological departments of the Rikshospital in Copenhagen. But there is no special examination in venereal disease, as the subject is included in the general examination in medicine. No one is allowed by the Danish Medical Association to practise as a specialist without at least three years' service at a special department. Nor may a Danish doctor practise as a specialist in obstetrics unless he has served for three months at a venereological department. In Denmark, as in Sweden, special courses of instruction (post-graduate) are given in venereal disease, and both in Denmark and Norway it has been found that discipline in the wards for male cases can best be kept by female nurses. Dr. Grön has tried both male and female nurses for male patients, and he concludes that ". . . . it must be regarded as undeniable that only women can maintain the order and cleanliness necessary to a hospital." In Copenhagen about 400 beds are reserved in the general hospitals for venereal disease—i.e., about one bed per 2000 inhabitants. This supply seems to be adequate. In addition to this hospital treatment much free polyclinic treatment is given; though the polyclinics attached to the two largest hospitals in Copenhagen provide ambulant treatment, this seems chiefly to be in the hands of the seven venereal disease dispensaries, to each of which two specialists are attached. The costs are borne by the local authorities, and each specialist devotes one hour a day to this work. Three of them are women doctors, and most of the female patients are attended by them. Twice a week facilities are provided for consultations in the evening. All the polyclinics and dispensaries are equipped with microscopes and accessories, but the Wassermann reactions are carried out only in one laboratory, the State Serum Institute, where about 60,000 Wassermann tests are made yearly. The charges are very moderate; public hospitals pay kr.1, members of insurance societies pay kr.2, and private patients kr.5. When poverty is claimed, the test is carried out free of charge.

Finland.

Finland appears to be the only one of the Scandinavian countries in which a system, corresponding to that of the Lock Hospitals, still exists. In Helsingfors there are two special hospitals, with 119 and 155 beds respectively, for women patients only. The central body, which drafts patients into these hospitals, is the "sanitetsbyra," which was founded in 1907 under the auspices of the Finnish Senate. A great point is made of segregating the most vicious so that early offenders shall suffer as little moral contamination as possible during their sojourn in these hospitals. Both are situated on the outskirts of the town, and in each there are three separate buildings, the inmates of which are strictly isolated from each other. One accommodates young patients admitted to the hospital for the first time, one accommodates older women of settled temperament, while the third and largest is reserved for hardened prostitutes and unruly persons. There are, further, two subdivisions in each of these buildings, one for syphilitic and the other for non-syphilitic cases. The "sanitetsbyra" provides a certain amount of polyclinic treatment for women who, after discharge from hospital for gonorrhœa, require local periodic treatment to prevent relapse. The "sanitetsbyra" also supervises the intermittent, anti-syphilitic treatment of patients in the symptom-free stage with injections of calomel, eight to ten of which are given, at intervals of five to eight days. These courses are repeated every three to five months for a period of three years. The results achieved are said to be very good; before this system of intermittent treatment was adopted, about twice as many cases of relapse as of new cases were sent to hospital. Now this ratio has been practically reversed; and it is certain that this system has greatly reduced the facilities for transmission of syphilis. When patients under this scheme of ambulatory treatment are irregular in their attendance, they are sent to hospital, where the injections can be given under stricter supervision. It is only in exceptional cases that the "sanitetsbyra" allows patients with obviously active venereal disease to be treated outside hospital. For poor persons who do not come under the administrative sphere of the "sanitetsbyra" there are two polyclinics in Helsingfors—one is open between 12 and 1 o'clock, and the other, which is administered jointly by the State and local authorities, is open from 6 to 7 in the evening. It has long been the rule in Finland that when patients suffering from venereal disease are admitted to a hospital, the cost of their treatment shall be defrayed by the State.

Norway.

Dr. Grön may perhaps be prejudiced when he compares his own country with the other Scandinavian countries in the matter of the teaching of venereal disease in medical schools. He writes: "In the meantime, the teaching of syphilis and venereal disease is fairly defective, probably in most countries, our own excepted." The Welander system for the hospital segregation of infants with congenital syphilis has found favourable soil in Norway where, in 1912, such a hospital was first opened. Here patients are kept till

they are 5 or 6 years old, by which age the outbreak of infectious symptoms, according to Dr. Grön, need no longer be feared. About 80 children have passed through this hospital in the past nine years. Whenever a positive Wassermann or a manifest outbreak of syphilis occurs in these cases, they are transferred for treatment to the neighbouring communal hospital at Ullevaal. Another such Welander home was opened in 1919 in Bergen with accommodation for 30 infants, the treatment given being specific as well as dietetic and hygienic. This Welander system seems to have been adopted in only one country (Germany) outside Scandinavia, and this is the more surprising as its importance is far-reaching. It is probable that in the near future the accommodation in these homes in Scandinavia will be materially increased so that children can be kept under close observation till they have reached the age of 10.

The most interesting feature of this survey by Dr. Grön is the remarkable influence which he shows to have been exerted by legislative measures on the incidence of venereal disease in Sweden and Finland. However deeply rooted the prejudice against legislative curtailment of the liberty of the individual may be, his figures, provided they are interpreted correctly, are a cogent argument in favour of bringing venereal disease under stricter legislative control than has hitherto been exercised in most European countries.

IRELAND.

(FROM A CORRESPONDENT.)

The Montgomery Lecture.

LAST week at the Royal College of Surgeons Prof. Grafton Elliot Smith delivered for the second year a Montgomery lecture. As in his lecture delivered a year ago, he dealt with the relation between the development of vision and evolution. The title of the lecture was the Influence of Vision in the Development of Man's Intellectual Powers. Prof. Elliot Smith showed how stereoscopic vision was necessary for "foresight," both in the literal and in the metaphorical sense.

Dinner to Major-General J. J. Gerrard, A.M.S.

Major-General J. J. Gerrard, D.D.M.S. for Ireland, was entertained to dinner by his friends a few days ago, prior to his leaving Ireland. General Gerrard is an old Dublin student, who, after a distinguished career in the Army Medical Service, has been for the past three years head of the Army Medical Department in Ireland. In that capacity he gained the esteem not only of his subordinates but of the civil profession. Replying to the toast of his health, he stated that his governing principle during the recent disturbed years in Ireland had been that the duty of a medical officer was to treat friends and foes alike. There is little doubt that General Gerrard's maintenance of high professional principles had its effect in dissuading the military authorities from carrying into effect their ill-judged order of a year ago demanding from civil practitioners, under penalty, the divulging of their patient's confidence.

Royal Zoological Society of Ireland.

The Royal Zoological Society took advantage of Prof. Elliot Smith's visit last week to persuade him to deliver a public lecture on Our Rude Ancestors, which attracted a very large audience. At the annual meeting of the society Sir Robert Woods, M.P., F.R.C.S.I., was elected President.

Jan. 30th.

VIENNA.

(FROM OUR OWN CORRESPONDENT.)

Suicide Statistics.

ALTHOUGH the relative number of suicides in a community would be expected to correspond to the economic conditions of the population, in Vienna, in pre-war times, both absolutely and relatively, more attempts at self-destruction were recorded than after the war. Whilst in 1913 the number of people who threw away their lives was 1485, the number dropped next year to 1286, and the following years showed only 887, 904, 700, and 842 cases. This was no doubt due to the absence on service of a large number of men. In 1919, when Vienna had nearly its normal number of inhabitants, there were 1189 attempts at suicide, in 1920 there were 1138, and for 1921 the records show 923 only. The sexes contributed nearly equally to this number; a peculiar fact, recognised for many years, is that the highest monthly figure is that of May, whilst the winter months are at the bottom of the scale. Shooting was the commonest method of self-destruction, then hanging, taking poison, leaping from a height, drowning, stabbing, and falling in front of a train (two females). The age-limit in 1921 was 86 years; no child suicide took place. As regards the causes of suicide, mental disease and other illness were responsible for over 190 cases; disappointment in love caused 125, and family trouble 183; reduced means accounted for about 60; and in 248 cases the reason was not ascertained. The most interesting item is the relatively small number of persons driven to the step by poverty.

Statistics of War Injuries in Austria.

The Austrian pensions bureau has recently published an instructive compilation, dealing with the number, the kind, and the degree of injuries and resulting permanent disablement sustained by soldiers of the Austrian Army in the war. Only persons classified as citizens of the present Austrian Republic are included in the statement. At the time of its compilation (June, 1921) 170,000 war invalids had put in pension claims. Exhaustive investigations gave the following pictures of the nature and distribution of injuries. Of each 1000 injuries there were: 2·16 amputations of the humerus, 0·93 of the brachium, 6·0 of the wrist, 7·16 of the fingers, 18·52 of the femur, 8·44 of the tibia, 5·93 of the foot, 3·41 of both feet, and 7·16 of the toes. Projectile wounds: upper limbs, including shoulder, 176 per 1000; injuries of the lower limbs, 144; injuries of the head, 37; injuries of the pelvis and vertebral column caused by projectiles, 36; frost-bite of feet, 1; frost-bite of hands, 7·13; total blindness of both eyes, 1·06; one-sided blindness, 16·05; other diseases of the eyes, 16; permanent damage by gassing, 2·16; permanent trouble of respiratory organs, 293; rheumatism, 16; hysteria, neurosis, and psychosis, nearly 50; malaria, 72·43; permanent deafness, about 6. Out of each 1000 injured claimants, 30 suffered from two forms of injury, 11 from 3, and 1 from 4 or more. Of these injured claimants 221 were classified as having 25 per cent. disability; 235, 35 per cent.; 179, 45 per cent.; 158, 55 per cent.; 85, 65 per cent.; 54, 75 per cent.; and the remainder (68) total disability. Only 69 per 1000 were classified below 15 per cent., and thereby disqualified for pensions; 716 were registered as permanently disabled, 512 as capable of improvement, and the remainder (72) as doubtful. Only 895 per 1000 were invalided in the fighting line, 21 were over 50 years of age when injured, and 207 below 20 years. Of invalided persons, dying from the effects of injury sustained during the war, in 85 per cent. death was clearly due to military service, 8 per cent. were doubtful, and 7 per cent. unlikely. Of each 100 deaths of these persons, 43 were due to tuberculosis, 2 to mental disease, and 7·5 to cardiac disease; all the mental and heart cases were due directly to military service; the tuberculous taint was evidently present in 16 per cent. of the others before they went on service, their decease being accelerated by the latter.

Settlement of the Medical Strike.

The tedious and detrimental conflict between the medical profession and the managing board of the

Krankenkassen (sick clubs), lasting for seven weeks, has been terminated by almost complete victory for the doctors. In previous letters I have mentioned the constant feeling of dissatisfaction with their pay and status amongst medical officers of these sick clubs; for political reasons, work other than manual labour was purposely considered less important by those responsible for the working of the national sickness insurance. The doctors ceased work until they should receive payment at the same ratio as the other officers of the clubs. The insured members of the clubs, however, understood very well where their own interests lay, and wished the medical men to be well paid and contented; their efforts, united with those of the profession, have resulted in an agreement, according to which the medical officers are paid at the ratio of about 1000 kronen per hour, with certain extra bonuses. Their payment will thus amount to 50,000–80,000 kronen per month (even now no more than about 3–4 pounds sterling). But the chief success gained lies in the fact that the rate of payment varies according to the index number of the cost of living, as do salaries in commercial and industrial concerns. By this concession on the part of the managing board, all conflicts as to rate of payment are evaded, and perfectly smooth working is ensured. The victory would have not been possible if the organisation of the profession had not been strong enough to prevent all blacklegging by outsiders; the club management had calculated on getting young doctors to do the necessary work, but were disappointed. They will now pay 180 per cent. more as fees than before the strike.

Jan. 20th.

CZECHO-SLOVAKIA.

(FROM OUR OWN CORRESPONDENT.)

A Bill to Legalise Optional Abortion.

Dr. M. Wassermann recently delivered before the Prague Medical Society a lecture which has aroused great interest among medical men. He spoke in favour of the Landova-Stychova Bill, which was repudiated by the Medical Society a year ago and, as it seemed at that time, by the whole medical profession in Czecho-Slovakia. The Bill includes a clause which would permit a woman to decide before the third month of pregnancy whether or not she will become a mother. The strongest argument of those who support the Bill is that abortions considered as criminal under the existing laws are nevertheless very frequent and very dangerous, especially for poor women who resort to an unscrupulous midwife. Dr. Wassermann estimated that about 100,000 illegal abortions are performed every year in Czecho-Slovakia, basing his calculations on the figures for France (400,000 a year) and Germany (500,000 a year). There is no evidence that a stricter application of the law would diminish the figure; the only result of the present law, as Dr. Wassermann sees it, is that even doctors do not dare to carry out the operation in a proper way; they undertake "examinations" with various instruments and employ violent massage in order to have an excuse should the case later come before a court of law. In this way even those who are able to afford the services of a physician are frequently maltreated, apart from those who fall into the hands of midwives. The Bill would permit abortion only when the operation was carried out by a qualified physician. It is claimed that adoption of the Bill would put a very strong weapon in the hands of the community against the increase of diseased and criminal families, and would be one of the few practicable means by which eugenics could be applied. At the meeting devoted to discussion of the paper official representatives of the medical faculty again took a very firm stand against the Bill, but its supporters were successful to the extent that the meeting recommended the formation of a committee of physicians and sociologists to study the question and make recommendations with the aim of remedying present conditions.

A "Social Medicine" Symposium.

A symposium of social medicine is in process of compilation by the *Medical Bulletin of Czecho-Slovakia*. This undertaking has resulted from numerous complaints to the effect that public health questions are too frequently solved without reference to medical men and in ways contrary to the interests and ideals of the profession. The consensus of opinion is that medical men have not, up to date, paid enough attention to social questions, and that the situation cannot be solved if the physicians abstain and sometimes ridicule schemes which at first sight seem to endanger the practice of medicine. The younger members of the medical profession, realising the present need, have arranged courses of lectures on social medicine, believing that insufficient education in this subject is given in the medical schools. The Prague medical faculty has a chair of social medicine, but the courses are optional and there is no examination; consequently medical students do not pay much attention to the subject. There is, however, a distinct tendency to advance the position of social medicine; it has been inserted among the subjects taught to those who apply for the certificate of public health.

The chair of social medicine in the new medical faculty at Brno has been filled by Dr. Fr. Hamza, late chief of the division of social pathology at the Ministry of Health.

Jan. 24th.

THE WOOD-HILL FUND.

THE following is the fifth list of subscriptions to the fund for reimbursing Dr. H. Wood-Hill in the very heavy expenses incurred by him in the case Clayden *v.* Wood-Hill. The amount previously acknowledged was £818 16*s.* 6*d.*

	£	*s.*	*d.*
Reigate Division of B.M.A., per Dr. T. Anstey-Chave, Hon. Sec.	15	8	0
Executive Committee of Nottingham Division of B.M.A., per Mr. A. M. Webber, Hon. Sec., on behalf of the following members of the Committee: Dr. J. H. Thompson, Dr. C. S. Miller, Mr. A. M. Webber, Dr. R. M. Rendall, Dr. J. H. Cox, Dr. O. H. Isard, each £1 1*s.*	6	6	0
Dr. F. N. G. Starr, Toronto; Dr. S. Johnson Taylor, Norwich; Dr. E. Farquhar Buzzard, London; Mr. W. H. Bowen, Cambridge; Birkenhead Medical Society, per Mr. W. Arthur Pierce, President; Mr. Harold D. Gillies, C.B.E., London .. each	5	5	0
Mr. Edward S. Crispin, C.B.E., Khartoum; Cheshire Panel Committee, per Dr. Alfred Cox, O.B.E. each	5	0	0
Medical Staff of Royal West Sussex Hospital, Chichester, per Dr. Arthur M. Barford	4	4	0
Mr. E. B. Waggett, D.S.O., London	3	3	0
Mr. Cecil J. Muriel, Norwich; Mr. V. Zachary Cope, London; Dr. K. Pretty, Ipswich; Mr. T. W. Hancock, O.B.E., Norwich; Sir Charles Ballance, K.C.M.G., C.B., London; Dr. F. C. James, Fressingfield; Dr. D. W. Collings, Southwold; Mr. G. Stevens Pope, Norwich; Mr. J. Cordy Keer and Mr. K. J. T. Keer, Wickham Market; Dr. Margaret L. A. Boileau, Ketteringham, Dr. R. Stopford Taylor, D.S.O., Liverpool .. each	2	2	0
Salisbury Division of B.M.A., per Mr. John Armitage, Hon. Sec.	2	0	0
Dr. John Stewart, Plaistow; Dr. C. H. Symons, Aylsham; Mr. Richard Slocock, Sheringham; Mr. J. B. Naden, Warrington; Surg.-Commander D. D. Turner, R.N., H.M.S. *Concord*; Dr. Ian D. Dickson, M.C., Norwich; Mr. Marcus M. Bowlan, London; Dr. C. G. Brentnall, M.C., Padgate; Mr. Harrison Cripps, London; Dr. J. A. Oswald Briggs, Nottingham; Mr. R. W. Payne, Lavenham; Dr. G. F. Bradley, Halstead; Mr. S. Price Hosegood, Llanwrtyd Wells; Mr. W. Arthur Pierce, Birkenhead; Dr. N. McConnell Boyce, Romford; Dr. E. Rowland Fothergill, Hove; Dr. E. C. Hardwicke, Woolpit; Dr. E. P. Satchell, Fulham .. .. each	1	1	0
Mr. S. R. H. Mathews, Bickley; Mr. A. A. Osman, D.S.C., London; Dr. J. J. Conybeare, London; Dr. F. J. Allen, Cambridge .. .. each	1	0	0
Miss Grace G. Griffiths, Bures; Dr. Jessie Hunter, Bracebridge .. .. each	0	10	6

Public Health Services.

CONTINUED HIGH SCOTTISH DEATH-RATE.

THE death-rate in the principal towns of Scotland recorded in the return of the Registrar-General for the week ending Jan. 28th remains high, being 0·4 more than that of the previous week already reported in THE LANCET, and actually higher than it has been for 47 years. Deaths attributed to influenza number 476, 97 more than in the previous week, while those from respiratory diseases show a decline of 25 to 656.

THE MEDICAL LIST.

In an address on Medical Benefit under the National Health Insurance Acts, read before the National Federation of Employees' Approved Societies at the London Chamber of Commerce on Jan. 24th, Mr. David Davis made a proposal to limit the right of admission to the Medical List, and the suggestion comes with some authority from the chairman of the Medical Service Sub-Committee of the London Insurance Committee. The process, Mr. Davis said, by which a doctor could become an insurance practitioner was too easy. He would like to see a committee of selection appointed for each area for the purpose of considering applications from practitioners for admission to the list. This raises the whole question of what has been called the open panel. The regulations as they stand provide that the Insurance Committee shall prepare a list, to be called the "Medical List," of the practitioners . . . . who have notified the Committee that they have accepted service upon the terms of service offered by the Committee and approved by the Minister. And in the schedule which sets out the terms of service for practitioners the clause runs (the italics are ours):—

> *Every* practitioner, other than a practitioner disqualified from taking service by reason of his name having been removed, after an inquiry, from any medical list in Great Britain, who gives notice to the Committee that he accepts service upon the terms for the time being in operation in the Committee's area *will have his name included in the Committee's Medical List.*

In other words, any practitioner who is on the Medical Register must be accepted for inclusion in the Medical List and will remain on the list until his name is removed, owing to unprofessional conduct of such a degree as to merit this extreme penalty, after two inquiries, one locally by the insurance committee and the other centrally by the special tribunal of the Ministry. The panel is open to all, but the list is purged after complaints have been received and inquired into. This process is cumbrous and tedious, too slow in the serious cases and much too cumbrous in the majority of cases which are of a trivial nature. With the open panel is associated the principle of free choice for the insured person, and the extent of that choice depends partly upon the size of the panel and partly upon the initiative of the insured person. Free choice has been limited in the past both by the unwillingness of certain practitioners to accept service and the reluctance of insured persons to change their doctor. But if the right to admission to the Medical List is limited, then free choice must go and insured persons will take the doctors provided for them by the proposed selection committee.

Those who designed the panel system were wise in providing free choice with an open panel, so that the best type of practitioner could accept service and the conditions of service might approximate to those of general practice. The only alternative would appear to be a whole-time salaried service, and this is probably the ultimate aim of those who suggest the limitation of the right of admission to the list. The question was raised in an interesting way at a recent meeting of the Burnley Insurance Committee, where certain members desired to refuse admission to a foreigner, presumably a Chinaman. But, as the medical secretary of the B.M.A. pointed out, "there is nothing to prevent a Chinaman or a native of any other country, whether he be yellow or black, practising in Great Britain if he takes a British degree . . . . We have," he added, "several Chinese who are members of the Association. The question of nationality does not arise."

In practice "free choice" is important because it cuts both ways and enables practitioners to make a choice as well as the insured person. The difficulty is to provide for the unreasonable patients whom no practitioner desires to treat. The failure of allocation schemes emphasises the embarrassment which arises when the right of free choice is interfered with. Approved society officials might be expected to help in preserving the liberty of their members and in encouraging them to place their names on the list of a practitioner at an early date before onset of illness. Hitherto the efforts of insurance committees in this direction have been unavailing, but the approved societies should be able to influence their adherents. Societies would perform a very useful part in explaining to their members the nature of their duties as well as of their privileges under the insurance scheme.

INFANT MORTALITY AND THE BUDGET.

The provisional figures for infant mortality in England and Wales during 1921, published in our last issue, must be regarded as satisfactory. The rate of 83 per 1000 births is only three points higher than the best ever recorded—viz., 80 in the year 1920. The hot summer of 1921 was, however, much more conducive to a high diarrhœa mortality than the preceding summer, and the Registrar-General's figures, given in his last quarterly return, show that the summer quarter of 1921 was the worst for diarrhœa since 1915, although not approaching the figures of 1911. The mean temperature recorded by the four-foot earth thermometer at Greenwich was 58·6° F. during the third quarter of 1921, whereas it was only 56·1° F. during the corresponding quarter of 1920—sufficient evidence of the very different climatic conditions prevailing in the two years. We have good reason, then, to be satisfied with the lowness of the infant mortality rate.

How to allot credit for the recent great improvement in infant mortality is a real difficulty which has nowhere been set forth better than in the report of the Medico-Sociological Committee of the B.M.A. Clearly it is not due to improvement in habitation, for the simple reason that housing conditions have recently become worse. It is more difficult to rebut the contention that the improvement in infant mortality, extending as it does to the pre-school period of life, is largely due to better and more intelligent feeding. Infant welfare centres have not confined their activities to the provision of advice; most of them make it possible for the mothers to secure safe milk. The mothers who attend the centres as a matter of course get milk for their infants if they cannot nurse them, but they also—and this is the important point—purchase milk for their other children up to 5 years of age. Thus milk now finds its way into urban households in which its use was often unknown in the old days. The Government Committee on the production and distribution of milk showed how inadequate is the consumption of milk per head in this country, while research work on vitamins has emphasised its value as a food. Reckless gratuitous distribution of milk may have taken place in a few towns, but a Government concerned for its child-life will hesitate before taking steps to reduce still further the consumption of milk at early ages. Circular 267 of the Ministry of Health seems to suggest that the gratuitous supply of milk should be limited to infants under 12 months. Experience has shown that in large towns it is the years between babyhood and school entrance which are starved of milk. To stop the gratuitous issue may benefit the national budget by a sum of £200,000, but it would prove an

expensive economy to check the wonderful progress recently made in child welfare.

SCHOOL CLOSURE FOR INFECTIOUS DISEASE.

The recent influenza epidemic appears to be responsible for school closure on a wholesale scale throughout the country, although Dr. Maxwell Williamson has set out in full in the Edinburgh papers his reasons for not closing the schools there. In cases where the teaching staff is so seriously depleted as to make it impossible to carry on, or where, as in certain rural districts, intercommunication is difficult and the schools are to some extent a distributing centre for disease, we agree that closure is unavoidable or, at least, excusable. But in urban districts and in the majority of rural areas school closure suggests that the health authority is shelving its responsibility rather than dealing with the problem on its own ground. Once the school is closed the authority has shut itself off from all knowledge of what is happening to the children, and as far as these are concerned the authority might as well be non-existent. The only centre for the control of infectious disease among children of school age is the school. Absentees are noted, and children sickening in school are promptly dealt with. The home can then be visited and arrangements made for adequate nursing. When the schools are closed the children are in the street, and if, as so often happens in an influenza epidemic, the parents are stricken, the children have no one to look after them. Moreover, since many of the mothers are out at work, they are unable to exercise any real supervision over their children, such as they get in school, and so the chances of infection are seriously increased. It is well known that influenza does not attack children in such an acute manner as its does adults; during the severe epidemic of 1918 it was not found necessary to close a single school in London. The recent epidemic has assumed a milder form, lasting not much more than a week in a given district, and thus even if school closure were defensible on general grounds it is bound to come too late. Measles is an almost uncontrollable disease whether in school or out of it, but it is possible with school supervision by teachers, nurses, and doctors to forecast very accurately the course of a measles epidemic, and by noting and following up the cases considerably to reduce the mortality rate. Class closure may have to be resorted to where the number of unprotected children is high, but contact infection in school is limited, and far too large a proportion of cases have been ascribed to school infection. In the case of scarlet fever and diphtheria school control, involving a systematic inspection of absentees, which generally reveals a missed case of a mild degree, is the only method of checking the spread of infection.

The school medical officer is not always to blame for school closure; in many cases he has to submit to public clamour, or his own views are overridden by the health authority. But over 12 years ago the advantages of school control of infectious disease were accepted by the leading authorities on school hygiene, and a determined effort should be made to educate public opinion on these lines.

THE DEVELOPMENT OF PUBLIC HEALTH SERVICES IN AMERICA.

A valuable store of information on public health problems and practice is contained in the Jubilee Historical Volume [1] of the American Public Health Association, which in 461 pages deals with many aspects of American public health from a developmental point of view.

The editor-in-chief, Dr. M. P. Ravenel, writes interestingly on the history of the American Public Health Association and its share in the marvellous progress in public health administration which has taken place. He may be congratulated on the various contributions to the volume, and on the fact that though 19 hygienists are concerned in its compilation, there is but little redundancy, and so far as we have seen, no evidence of essential differences in policy. The article by Dr. Stephen Smith, the centenarian first President of the American Public Health Association, gives interesting peeps into the past, and incidentally may be assumed to convey the author's secret of longevity, for he quotes, apparently with approval, the remark of a recent American authority, "I keep my stomach and brain busy." Dr. Peter Bryce, of Ottawa, tells the story of public health in Canada, and Professor F. P. Gorham, of the Brown University, gives a fairly exhaustive history of bacteriology and its contribution to public health work. He quotes the pioneer work of Burdon-Sanderson, who in 1871 demonstrated the presence of bacteria in water, and attributes the first use in 1897 of chlorine for disinfecting drinking water to the late Sir Sims Woodhead. It is noted that the first municipal laboratory in the States was established in 1888 in Providence, R.I., where Dr. Charles V. Chapin was, and happily still is, the chief health officer.

Statistical Progress.—The statistical progress of the States is described by Dr. Frederick L. Hoffman in small space. The account is necessarily somewhat incomplete, but what is given is interesting and learned, and makes one wish that Dr. Hoffman, who is master of his subject, would give a complete statistical account of progress during the last 50 years. He describes an early life-table made by Dr. E. Wigglesworth in 1789, dealing with the experience of Massachusetts and New Hampshire. This table, like that of Dr. Price for Northampton, was based on deaths alone, and therefore its results are somewhat misleading. It is noteworthy that for four cities, New York, Philadelphia, Boston, and New Orleans, mortality statistics are available for a nearly unbroken hundred years. Dr. Hoffman's review does not extend to the date of issue of the important life-tables, based on the experience of 1909 and 1910, which were published by the Federal Census Office in 1916. His concluding remarks are worthy of quotation, for they place statistical evidence, especially when this involves difficult mathematical calculations, in its place: "In the final analysis, observational experience is as essential to sound judgment as statistical and mathematical calculations. The latter merely reduce to a measurable basis conclusions otherwise vague and indefinite, but nevertheless accurate, if used with restraint and caution, for practical purposes."

Quarantine Systems.—The chapter by Surgeon-General Cummings on the United States quarantine system brings out clearly the differences between the English and the American systems. The American system is "unique in the maintenance of a double line of sanitary defence." Perhaps it is not well known that it includes land quarantine, especially as regards Mexico, whence there is risk of the introduction of a highly virulent strain of small-pox, as well as of typhus; for, as Dr. Cummings says, the typhus condition in Mexico during several years past has been even more serious than the menace from Europe.

State and Municipal Control of Disease.—As might be anticipated, Dr. Chapin's contribution on the history of State municipal control of disease is fresh and original. He pursues his well-known thesis that it is not dirt, but dirt carrying human excretions, which is dangerous, and illustrates this by the action of the Federal Government even so late as 1898. Waring was then sent to Havana to stamp out yellow-fever by cleansing the city, and though his untiring energy made Havana the cleanest city in the western world, yellow-fever continued. He points out that the acme of the filth theory was the sewer-gas bogey. Dr. Chapin bears eloquent testimony to the value of vital statistics but adds that "figures do not measure the terror of epidemics, nor the tears of the mother at her baby's grave, nor the sorrow of the widow whose helpmate has been snatched away in the prime of life. To have prevented these not once, but a million times, justifies our half-century of public health work."

[1] A Half Century of Public Health. Jubilee Historical Volume of the American Public Health Association. Mazyck P. Ravenel, Editor-in-Chief. Pp. 461–xl. New York: American Public Health Association, 370, Seventh-avenue. Cloth, $5.25; stiff paper cover, $3.75.

Prof. G. C. Whipple gives a review of 50 years of water purification; Mr. R. Hering writes on the removal of sewage and solid refuse; Mr. E. P. Phelps on stream pollution by industrial wastes; Dr. C. A. Alsberg on progress in Federal food control; and Prof. S. C. Prescott, of the Massachusetts Institute of Technology, gives an admirable review of food conservation. The chapter on milk and its relation to public health, by Dr. C. E. North, gives in 52 pages a good account of the one branch of public health work in which America is far ahead of Britain. Dr. P. Van Ingen reviews the history of child welfare work in the United States. Mr. L. Veiller writes on housing. Other chapters deal with ventilation, public health nursing, and the history of medical entomology; and the veteran Prof. G. M. Kober, of Washington, D.C., contributes a valuable history of industrial hygiene.

It is clear that the review of 50 years covers a large share of the public health field, but there are striking omissions. The control of epidemic diseases, of tuberculosis, and of venereal diseases receives scant or no mention, the last named perhaps because of the recentness of its initiation. The important inter-relation between general social work and public health nursing is not developed, and consideration of the problems of poverty and hospital service are omitted, although much valuable work has been done towards their solution, and still more is being done as the solidarity of social and public health work becomes more fully realised. But on the subjects touched on the volume is extremely interesting, and will enable the public health worker in this country to institute useful comparisons and to acquire valuable suggestions for improved work.

The Services.

ROYAL ARMY MEDICAL COLLEGE.

Maj. and Bt. Lt.-Col. W. P. MacArthur, R.A.M.C., has been appointed Professor, vice Lt.-Col. J. C. Kennedy, R.A.M.C.

ARMY MEDICAL SERVICE.

Col. H. S. Thurston, late R.A.M.C., retires on ret. pay.

ROYAL ARMY MEDICAL CORPS.

Lt.-Col. and Bt.-Col. P. S. Lelean retires on ret. pay.

Maj. J. Fairbairn retires on ret. pay and is granted the rank of Lt.-Col.

Maj. and Bt. Lt.-Col. W. P. MacArthur relinquishes the acting rank of Lt.-Col.

Temp. Capt. E. G. D. Milsom relinquishes his commn. and is granted the rank of Maj.

Temp. Capt. G. F. Woodroffe relinquishes his commn. and retains the rank of Capt.

ARMY DENTAL CORPS.

Lt. (temp. Capt.) A. B. H. Cole to be Capt.

TERRITORIAL ARMY.

Capt. T. H. Richmond to be Maj.

Capts. G. Adam and R. W. Smith (late R.A.M.C.) to be Capts.

Officers relinquishing their commns.: Majs. P. G. Williamson (granted the rank of Lt.-Col. with permission to wear the prescribed uniform) and L. P. Gamgee (1st S. Genl. Hosp.), and Capts. C. C. Fitzgerald, H. Watts-Taylor (retains the rank of Capt.), and F. H. C. Watson (granted the rank of Maj.).

WOMEN'S MEDICAL SERVICE OF INDIA.

Dr. F. Hamilton Browne has been transferred from the Lady Elgin Hospital, Jubbalpore, to the charge of the Dufferin Hospital, Calcutta. Dr. C. Cuthbert on arrival in India has been posted as resident medical officer of the Dufferin Hospital, and Dr. Millicent Webb has been transferred from the charge of that hospital to the office of principal of the Women's Medical School, Agra. Dr. D. D'Abreu has been appointed temporarily to the charge of the Lady Elgin Hospital, Jubbalpore, Dr. C. Constance Hart to the charge of the Dufferin Hospital, Karachi, and Dr. Alice O'Reilly to the charge of the Lady Aitchison Hospital, Lahore. Dr. Gertrude Campbell has been appointed principal and professor of obstetrics, and Dr. Grace Stapleton, professor of medicine in the Lady Hardinge Medical College for Women, Delhi. On arrival in India Dr. Marguerite Stewart has been posted temporarily to the Government Victoria Hospital, Madras.

Correspondence.

"Audi alteram partem."

EPITHELIOMA IN KASHMIR.

To the Editor of THE LANCET.

SIR,—An annotation in your issue of last week "On Keeping Warm" refers to epithelioma of the abdominal wall that occurs in Kashmiris from repeated burning by the kangri. The condition occurs in other parts of the body from the same cause. When I last visited the Kashmir Mission Hospital, Srinagar (September, 1918), the senior surgeon of that institution showed me six cases, from all of whom he had removed epithelioma of the upper anterior and (mostly) inner part of the thigh. In two other cases the cancer had been removed from the lower abdominal wall. The braziers or earthen pots are partly filled with live charcoal, and placed between the thighs while the victim is squatting, the chaddar or outer body covering enclosing both brazier and body. The sides and rim of the heated charcoal container come into contact with the skin and inflict burns resulting in scars from which cancerous growths develop. There could be no better demonstration of cause and effect; it reminds one of the same form of growth occurring in the lower lip from the clay pipe and in the scrotum of chimney sweeps. I was informed that in a very high percentage of these cases there is no recurrence after excision. The condition is exceedingly common in Kashmir.

You refer in the same note to the splendid work being done by the Rev. C. E. Tyndale-Biscoe, of the C.M.S., in his endeavours to inculcate the athletic spirit into the young Kashmiri as a means of maintaining the warmth of the body in winter, and I can speak with personal knowledge of his laudable efforts in this direction. But those who mostly suffer from the growths under reference are the poorest class, who are ill-fed and scantily clothed, and find themselves obliged to resort to the form of artificial heating described.

I would ask you to allow me to say a few words about the Kashmir Mission Hospital at Srinagar, in which there is a large amount of benevolent work of a very high standard done quietly and without show by a devoted staff of medical officers and nurses. It is an ideal institution, located on a knoll below the Suliman-i-Takht, having the glorious Dal lake on one side and the city on the other, the stately Jhelum flowing close to its base. What struck me most was that its wonderful efficiency is attained in an extraordinarily economical way. One special direction in which the cost is kept down is by having a large part of the hospital equipment, medical appliances, and surgical instruments made in Kashmir, where labour is comparatively cheap. Medical administrators from India visiting Kashmir might with advantage go over this hospital; they will meet with the utmost civility from the staff.

I am, Sir, yours faithfully,

P. HEHIR,
Major-General, I.M.S. (ret.)

Jan. 29th, 1922.

ACUTE ANAEROBIC (*B. WELCHII*) INFECTION OF FIBROIDS.

To the Editor of THE LANCET.

SIR,—I am much interested in Mr. W. B. Gabriel and Dr. A. Neave Kingsbury's communication in THE LANCET of Jan. 28th, having described a similar case (with illustrations) in the Lettsomian lectures for 1920, published in the Transactions of the Medical Society of London and separately.[1]

[1] Tumours Complicating Pregnancy, Labour, and the Puerperium. Harrison and Sons. 1920.

In Gabriel and Kingsbury's case it would be interesting to know if several parts of the uterine tumours were examined microscopically so as to exclude the possibility of myosarcoma, giving rise to the sarcoma in the jaw. I have seen a case of suppurating myosarcoma of the uterus with a secondary growth on the kidney. In this case, had there been no secondary growth, it would have been very difficult to decide by microscopical examination between a myosarcoma and an inflamed and very cellular myoma. I have met with abscesses in uterine fibroids in a virgin containing a pure culture of streptococci, the infection apparently having occurred through the blood. A case of necrobiosis ("red degeneration") in a fibroid was bacteriologically sterile (Case 14, loc. cit.). I do not think, therefore, that the postulate of Mr. Gabriel and Dr. Kingsbury "that necrobiosis of uterine fibroids is due to an anaerobic infection derived from the cavity of the uterus" can be generally true.

But the subject of microbic infection of fibroids is of great interest and needs further study. Its importance in pregnancy I have emphasised in the work alluded to. Its bearings on conservative and radium treatment are not less important.

I am, Sir, yours faithfully,

HERBERT R. SPENCER.

Harley-street, W., Jan. 29th, 1922.

THE ERECT POSTURE.

To the Editor of THE LANCET.

SIR,—In reply to Dr. Harry Campbell's letter in your issue of Jan. 21st criticising my paper on this subject in your issue of the previous week, charwomen do not enjoy the "all fours" position, for they do not adopt it but merely a pseudo-quadruped attitude—viz., on the hands and knees, principally the latter, so that the hands may be freer for work—and that is the source of most of their troubles, the pads which they should wear being either missing or insufficient. Otherwise their work is very healthy, and the source of the popular objection to it is rather the stress put upon the pride than upon the back. Young girls in cookery schools, too, are now so full of the pride of the erect posture and of that lofty atmosphere to which their emotions have raised them that who dare mention to them such a lowly attitude as the "all fours" position, much less their adoption of it! Corsets, too, probably interfere. Speaking of rhythmical muscular contractions as an aid to the circulation, the most important muscle in this respect, apart, of course, from the heart, is the diaphragm, and it is worthy of note that the efficiency of that muscle is much greater in the quadruped than in the erect posture, for in the former the abdominal contents gravitate towards it, improve its purchase, and increase its recoil, whereas in the latter the reverse is the case, and the weight of the thoracic viscera interferes with its recoil.

Dr. Campbell refers to the suction action between the lungs and the chest wall. I mentioned this in my paper as a factor in preventing ptosis of the thoracic contents (p. 28). Unfortunately, you did not have space to publish that remark. I also stated that the fibrous tissue of the mediastinum and lung roots helped to hold up the thoracic viscera by its attachment to the vertebral column, sternum, and cervical fascia. I did not state that the whole weight of the lungs was supported by the diaphragm, but when I said that the two upper pairs of ribs (and possibly others to a less extent) pressed upon the upper portions of the lungs "like a collar" I meant that there may be a positive pressure, greatest during expiration, in the debilitated, where the atonic muscles supporting the ribs and sternum were stretched and allowed the thoracic framework to sag unduly. Thus the upper part of the lungs may be actually squeezed between the rib arches, the vertebral column, and the lung roots, while the upper pleural spaces and underlying lungs are divided by the ribs into a number of compartments in which the respiratory variations in pressure may be quite inadequate and on a decreasing scale from below up; for the movement between the parietal and visceral pleura is very slight and in proportion to the small and inadequate lift given to the thoracic framework on inspiration. This is supported by the fact that pleurisy is very seldom detected at the lung apex although it may often occur.

With reference to the question of increased blood pressure produced by the erect posture, it has been shown that the blood pressure is higher in the upright than in the recumbent posture under similar conditions. It must be remembered, too, that the cerebral vessels are poorly supplied with vasomotor fibres, and that the onus of regulating the intracranial blood pressure and supply rests largely with the splanchnics, the resistance of the cerebral arterioles altering very little; thus, on rising, the splanchnic vasoconstrictors and the left ventricle have to raise the cerebral circulation to the normal again. The syphonic action of the veins lowers the capillary, and so adds to the need of increased arterial pressure; that of the lymphatics would, however, have the reverse effect; hence the whole cerebral circulation is probably at a slightly lower pressure in the upright than in a stooping position. I did not say that on rising from the stooping to the erect posture there is a rise of 20 per cent. in the blood pressure; what I said was that there may be an increased need of as much as 20 per cent. of the normal blood pressure in the cerebral and therefore in the rest of the arterial ystem. But in all the higher animals in health the arterial pressure is considerably above their needs for all positions, hence so great a rise does not occur, but in sickness and disordered conditions of the circulation this potential need may become an actual one.

I am, Sir, yours faithfully,

Liverpool, Jan. 26th, 1922. J. KNOX THOMPSON.

THE D'HERELLE PHENOMENON.

To the Editor of THE LANCET.

SIR,—The leading article on the d'Herelle phenomenon in THE LANCET of Dec. 3rd last invites attention, on the one hand, to the alteration in functional properties of bacteria and the transmission of this to their descendants; and on the other, to some possible applications thereof.

To alter the properties of a bacterium an external stimulus is necessary. If this is of moderate intensity, the bacterium being a living organism can adjust itself; while if it is excessive the result will be paralysis. The external stimuli which we can apply are such as act on the bacterium in a general manner—e.g., change of temperature, reaction of the medium in which it lives; or they are such as are limited to one particular function or group of functions, such as virulence—e.g., the action of an antiserum. Taking the case of the higher animals, we might say that food and climate were general stimuli which act on all functions with little or no preference for one more than another, whereas diphtheria toxin is a stimulus limited to certain animals and to certain organs of these animals. It is strongly selective in its action.

It is by means of the selective stimuli of antisera that we can easily alter some of the properties of bacteria. The alteration is transmitted to the descendants. Bacteria are unicellular organisms, and it is permissible to assume that their various functions—digestion, reproduction, and virulence—are possessed by the whole of the protoplasm during at least some portion of the life of the bacterium. If, now, the stimulus of an antiserum is applied to the protoplasm it is reasonable to suppose that the protoplasm which grows from, or is reproduced from this, will show the property on which the stimulus acted, diminished or increased. If the potency of the antiserum was so strong as to destroy or paralyse the property, the descendants will show this property diminished or almost abolished; whereas if the serum was feeble the property in the descendants of the bacterium will

be intensified. To the former action the author gave the name piantication and to the latter anapiantication. The experiments on which the above statements are based were described in the *Medical Journal of South Africa*, 1914, and in the publications of the South African Institute for Medical Research, 1915 and 1917. They were carried out first by the writer alone and later in conjunction with Sir F. S. Lister. Similar results were obtained with several species of bacteria.

To be able readily to alter the virulence of a bacterium outside the body without interfering with its capacity to grow on media may be of assistance in the production of antisera, in the prophylactic inoculation of individuals against certain diseases, and in the therapeutic inoculation of those already infected. An illustration may make clear what is suggested under the first and second heads. The cells of the body of an animal which has been inoculated may be likened to a company of men who are being trained to jump over hurdles. If the full height is presented straight away to the men many will be unable to clear the obstacles, and will injure themselves in trying to do so. If, however, the men are trained by being required on the first day to jump over a low obstacle and the height of this is increased on succeeding days, most if not all of them will soon succeed in clearing the hurdles without difficulty or injury. Similarly, if a highly virulent organism is injected straight away into an animal many cells may be injured. A gradation in the virulence of a vaccine in addition to an alteration in the quantity injected is desirable. The procedure known as piantication affords a ready means of diminishing the virulence.

With regard to the third point: when vaccines are injected for therapeutic purposes it is to be recollected that the organism infecting the patient is living and is capable of adjusting itself to the increasing immune properties of the patient's blood resulting from inoculation. It may be supposed that as a result of stimulation of the bacterium in the tissues an undesirably strong focal reaction of the patient's tissues might be induced. It might therefore be of distinct advantage to begin treatment with a vaccine whose most pronounced quality was not its virulence. The patient might be aided by stimulating some other quality such as his power to produce antitoxin in order to overcome the disease from which he is suffering. This may perhaps explain the beneficial results which have followed the use of sensitised vaccines.

I am, Sir, yours faithfully,

Devonshire-place, W., Jan. 20th, 1922. A. R. FRIEL.

DIRECT STIMULATION OF LEUCOPOIESIS IN INFLUENZA.

To the Editor of THE LANCET.

SIR,—The valuable paper in your columns by Dr. J. G. Willmore and Dr. F. M. Gardner-Medwin (Jan. 21st) on this subject is of such manifold interest that I should be glad if you would insert a few remarks by one whose main line of work for some 18 months has been the bone marrow. Injections of nucleinate of soda certainly produce an increase in the number of leucocytes in the circulation, but I know of no evidence that they are direct stimuli to the production of leucocytes in the marrow. Muir [1] and also Andrewes [2] have shown that during the rapid establishment of an infection there is no evidence that the leucocytosis is due to increased formation in the marrow but rather to the addition of a number of ripe cells to the blood. The bone marrow always carries a large stock of neutrophile polymorphonuclear leucocytes, and in most infections these come out in response to a "chemiotactic whistle," but in influenza they remain in the marrow. Is this latter phenomenon due to the absence of a "chemiotactic whistle" or is it due to a poisoning of the cells in the marrow?

Willmore and Gardner-Medwin seem to have shown that it is due to the absence of the chemiotactic call, as the cells are quite capable of emigration in response to another stimulus. It will be recalled that the establishment of a neutrophile leucoblastic reaction in the marrow requires at least 40 hours from the onset of the infection, and that therefore the injection of nucleinate of soda must be calling forth cells already present in the marrow. Examination of the marrow of cases succumbing to influenza does not demonstrate any definite depletion or exhaustion of the marrow—that is to say, one is not dealing with an acute aplasia of the marrow. I would suggest that this method of treatment does not depend upon direct stimulation of leucopoiesis, but upon the establishment of a leucocytosis at the expense of cells already ripe in the bone marrow.

Cinnamic acid is another of the substances capable of calling forth a leucocytosis, and J. C. Ross,[3] who used cinnamon oil in the treatment of influenza, employed this fact successfully, even if unwittingly.

I am, Sir, yours faithfully,

ALFRED PINEY, M.R.C.P. Lond.

Pathological Department, The University, Birmingham, Jan. 24th, 1922.

[1] Muir, R.: Jour. of Path. and Bact., 1901, vii., 161.
[2] Andrewes, F. W.: THE LANCET, 1910, i., 1737, and ii., 8, 83, and 153.

CHLOROPHYLL AND VITAMIN A.

To the Editor of THE LANCET.

SIR,—No answer having so far been forthcoming to Dr. E. Biddle's question in your issue of Jan. 21st (p. 154), as to whether it may be assumed that the vitamins as well as the chlorophyll are concentrated in "phyllosan," I venture to make a few observations, both particular and general.

First and foremost, it seems to me that although it is easy to conceive the concentration of chlorophyll, it is by no means obvious how we can theorise concerning the physical states or qualities (if any) of a substance so elusive and imponderable as a vitamin.

Another point raised by THE LANCET editorially is why concentrated chlorophyll should be required when abundant supplies of that material can be obtained cheaply from greenstuff such as spinach. In answer one may ask, Why use quinine instead of giving large doses of bark? Why use tinctures, or juices, or other preparations from seeds, roots, or leaves when one might administer instead corresponding parts of the untreated plant?

As to the actual presence of vitamin A in chlorophyll extracted by Prof. Emil Bürgi's process we have his high authority on that point. At the same time one may venture to hope that he will be induced to publish in THE LANCET a full statement of the facts of the case. The analogy between chlorophyll and hæmoglobin and the apparently established value of phyllosan in anæmia offer a fine stimulus to the scientific imagination, and it is to be hoped that the whole matter will be thoroughly sifted in the interests of medical science.

I am, Sir, yours faithfully,

DAVID WALSH, M.D.

Bentinck-street, W., Jan. 30th, 1922.

INFECTION OF UTERINE FIBROIDS.

To the Editor of THE LANCET.

SIR,—It is allowed that uterine fibroids may undergo degeneration without infection, the change causing little or no symptoms. It does not follow that a degenerative change, because acute and causing symptoms, is due to infection. Mr. W. B. Gabriel and Dr. A. N. Kingsbury, in your issue of Jan. 28th, suggest from the degenerating and infected (subperitoneal) fibroid they describe, that the red degeneration of fibroids is due to infection. The change in the latter state—they argue—cannot be due to a primary thrombosis—because thrombosis is often not demonstrable: it is unlikely to be due to an aseptic necrosis,

[3] Ross, J. C.: THE LANCET, 1906, ii., 1240.

because the pathological process is acute and has general ill-effects on the patient. Because their patient was ill, and because the patients suffering from red degeneration are also ill, they postulate that the necrobiosis of uterine fibroids is due to an infection and to a similar infection (anaerobic).

But the comparison of their patient's illness—so grave that she rapidly succumbed—with the illness of a patient suffering from the red degeneration of a fibroid is beside the mark. The "toxæmia" in the red degeneration of fibroids is usually quite a mild affair—the temperature not reaching 103°F. The condition is much more comparable with that induced by the twisting of the pedicle of an ovarian cyst. Here, also, we get pain, swelling, and fever—signs of inflammation; but this condition is not an inflammation, nor is it due to infection. In your issue of May 9th, 1920, I pointed this out; and showed reason for believing that the red degeneration of fibroids is mechanically caused.[1]

I am, Sir, yours faithfully,

Jan. 29th, 1922. R. H. PARAMORE, F.R.C.S. Eng.

A CASE FOR DIAGNOSIS.

To the Editor of THE LANCET.

SIR,—With reference to the case described by DR. J. J. Suckling in THE LANCET of Jan. 14th, may I suggest a more probable cause than those so far advanced—namely, embolism of a branch of the superior mesenteric artery. I have seen two cases of this condition in the last three months, in which the embolus together with its source of origin were clearly demonstrated at the post mortem. The first case occurred in a man of about 60, in whom the greater part of the small intestine and the ascending colon were in an early stage of gangrene. He had advanced atheroma of the coronary arteries, and the muscle at the apex of the left ventricle was very thin and almost completely replaced by fibrous tissue; and there was a large ante-mortem thrombus adherent in this region. There was no doubt that this was the source of the embolus which was found in the superior mesenteric artery.

The second case occurred in a young man, the subject of subacute bacterial endocarditis which had not been discovered during life. A branch of the superior mesenteric artery had been blocked by a small fragment of vegetation from the aortic valve, and about 4 ft. of the upper part of the ileum was gangrenous.

Both these cases had been diagnosed as acute obstruction; and the second was operated upon for this condition.—I am, Sir, yours faithfully,

Oxford, Jan. 30th, 1922. W. T. COLLIER, Junr.

THE FUNCTIONS OF THE MEDICAL SERVICE SUB-COMMITTEE.

To the Editor of THE LANCET.

SIR,—The Medical Service Sub-Committee of the London Insurance Committee is over-zealous. It has recently held inquiries in two cases of complaint: one from a patient as to the kind of medicine she was receiving, and the other from an approved society on the question of a final certificate given under protest by an insurance practitioner in the case of a deceased insured person. It is a matter of doubt whether any other insurance committee in the kingdom would have wasted the time of practitioners in holding such inquiries.

The first case turned simply on the question of a particular prescription obtained from a specialist, which the patient desired the practitioner to order. Her complaint was that the medicine was not the same as that which she obtained from the specialist. After two hearings the Committee came to the conclusion that there was no foundation for the allegation that the treatment provided by the practitioner was inappropriate. But it is no part of the practitioner's obligation to order the same prescription as a specialist. He must surely use his own discretion in this matter, and how are the laymen on the Committee to decide a question of appropriate treatment unless the medical men give them instruction on therapeutics? On this point the London Panel Committee gave a very decided opinion.

"We are of opinion that insured persons should not be allowed to make complaints based upon the correctness of diagnosis or treatment as such questions must, in all cases, be matters of individual professional opinion, and we think our representatives on the Medical Service Sub-Committee should resist attempts to raise such questions in the Sub-Committee and should refuse to place their professional knowledge at the disposal of the Sub-Committee in such cases."

In the second case, a scandal is made of the action of an insurance practitioner who was asked by the widow of an insured person for a final certificate which she had been requested to obtain by an agent of the approved society. If the society require a final certificate in cases terminating in death they can provide themselves with a copy of the death certificate from the registrar. The easier course is to demand a "declaring-off certificate," for which the friends of the deceased person then worry the doctor. The Medical Service Sub-Committee does not seem to have taken exception to this extraordinary demand on the part of the society, although the secretary of the society admitted that while it was the practice of the society to apply for such a certificate, "they paid without a final certificate if the practitioner felt that he could not give such a certificate or refused to do so." And yet the agent exerted such pressure on the widow that she persisted in her demand from the doctor who, after pointing out that no declaring-off certificate could be used for deceased persons, ultimately gave the certificate in the terms objected to in order to emphasise the absurdity of the demand. The fault surely lies with the machinery of the approved societies, who should be satisfied with the evidence of death available in the ordinary death certificate. The sooner such an unreasonable requirement is abolished the better. And is there not something wrong with the sense of proportion of a medical service sub-committee which makes the profound discovery that "no provision is made in the medical certification rules for a practitioner to furnish a final certificate in the case of death"?

I am, Sir, yours faithfully,

Jan. 30th, 1922. EX-PANEL DOCTOR.

GLASGOW MEDICAL LUNCH CLUB.—On Jan. 12th Dr. James A. Adams, representative of the Royal Faculty of Physicians and Surgeons of Glasgow on the General Medical Council, was the guest of the club, and gave an address on the work of the Council in the matter of reconstruction of the Medical Act, which he described as an effort to screw up education by means of considerable—and he felt, proper—changes. The preliminary examination was to be made stiffer, and the time given to pass the final was to be limited to 18 months. In one case a man had come up 14 times for his final examination. It was also proposed to raise to a much higher standard the degree of D.P.H., so that many fewer would be able to obtain it; in his opinion the D.P.H. degree should be given to as many people as wanted it, provided they had sufficient knowledge of matters connected with public health. It would be very useful to the general practitioner, for the majority of cases in which disease could be arrested at the outset came before him.

On Jan. 19th the Club was addressed by Dr. W. R. Jack, visiting physician to Glasgow Royal Infirmary, on the subject of "The Unit System as Applied to Clinical Teaching and to Medical Research." Dr. Jack stated that the unit system, if properly handled, could do much to improve both teacher and taught and to stimulate research. The system had been planned largely for the encouragement of team-work, which must necessarily be incomplete if it began only at the gates of the hospital. Unless the hospital staffs could secure the cordial coöperation of the practitioner, who saw cases in the earliest stages of their development, much valuable information must infallibly be lost. What was needed was a closer coöperation between practitioner and hospital staff.

[1] Causation of Red Degeneration.

Medical News.

UNIVERSITY OF OXFORD: ROLLESTON MEMORIAL PRIZE, 1922.—The next award of this prize for original research in any subject comprised in the following list: Physiology and pathology, animal and vegetable morphology, and anthropology, will be made in Trinity term, 1922. The value of the prize is now about £100. No candidate will be eligible: (1) who has not either passed the examinations for the B.A. degree or the B.M. degree at Oxford, or for the B.A. degree or the M.B. degree at Cambridge, or been admitted as a candidate for the degree of B.Sc. at Oxford, or as an advanced student for the degree of B.A. at Cambridge; (2) who has exceeded a period of six years from attaining any of these qualifications; (3) who has exceeded 10 terms from his matriculation. Candidates wishing to compete must forward their memoirs to the Registrar before March 31st, 1922, from whom any further particulars may be obtained.

Christopher Welch Scholarship, 1922.—An examination for the above scholarship will be held at the University Museum, beginning on Monday, July 3rd, 1922, at 9 A.M. Candidates must be undergraduate members of the University who have not exceeded the twelfth term from their matriculation. They may offer any one of the subjects: Animal physiology, botany, zoology; and they must give notice of the subject selected by them to the Registrar of the University not later than March 1st, 1922. They must further enter their names in person or by letter at the University Registry not later than Monday, April 3rd, and must at the same time produce or send to the Registrar evidence of their capacity for original observation and research. A candidate may also submit to the examiners any original work previously done by him.

ROYAL COLLEGE OF PHYSICIANS OF LONDON.—An ordinary Comitia of the College was held on Jan. 26th, Sir Norman Moore, the President, being in the chair. The following were admitted as Members: Drs. Marjorie A. Blandy, Thomas K. Boney, Hugh R. Dutton, Charles F. T. East, Guy M. Kendall, Guy A. Lendon, James P. Martin, Thomas S. Nelson, W. J. Oliver, Noel O. Richards, and Leon J. Solway.—Licences to practise physic were granted to 90 candidates, who had conformed to the by-laws and regulations, and passed the necessary examinations.—Diplomas in public health, tropical medicine and hygiene, ophthalmic medicine and surgery, and in psychological medicine were granted, jointly with the Royal College of Surgeons.—Dr. Robert Hutchison, Dr. Arthur Whitfield, Dr. E. Goodall, and Dr. E. F. Buzzard were elected councillors, on the nomination of the Council, to take the place of Dr. H. Head, Dr. J. W. Carr, Dr. G. F. Still, and Sir Maurice Craig, who retire by rotation.—An application from Dr. Philip D. Turner asking for restoration of the Membership, which he resigned in 1899, was granted.—Dr. Philip H. Wells asked leave to resign the Membership, which he took in October last, and this was accorded.—A communication was received from the chairman of a committee for the formation of a Canadian College of Physicians and Surgeons, asking the opinion of the College on the question of affiliation with the Royal Colleges of Physicians and Surgeons in England.—Leave was granted to the secretary of the Société pour l'étude de la Gravure Française to photograph the bust of Dr. Richard Mead possessed by the College.—The Licence of the College, withdrawn in January, 1918, was restored to Bertie Cecil Eskell.—The following appointments were announced: Dr. Arnold Chaplin to deliver the Harveian Oration this year; Sir Maurice Craig to deliver the Bradshaw Lecture this year; Dr. J. B. Christopherson as Representative of the College on a section devoted to tropical diseases in connexion with the British Empire Exhibition, 1923; Dr. W. G. Savage to deliver the Milroy Lectures in 1923; Sir Francis Champneys to represent the College on the Central Midwives' Board; the President and Dr. Henry Head to represent the College on the Conjoint Board of Scientific Societies.—On the recommendation of the Committee of Management, Bromsgrove School and Taunton's School, Southampton, were added to the list of institutions recognised for instruction in chemistry and physics. The University of Cape Town and the University of Witwatersrand, Johannesburg, were added to the list of universities whose graduates are admissible to the final examination of the Conjoint Board.

ROYAL COLLEGES OF PHYSICIANS OF LONDON AND SURGEONS OF ENGLAND.—The following candidates have passed the Final Examination of the Conjoint Board:—

Abdel Razik Abdel Razik, Cairo; *Charlotte K. J. Almond, King's Coll.; James L. Armour, Liverpool; *Marjorie H. S. Auden, St. Mary's; *Margarita S. Barfield, Royal Free; Frans Wepener Bekker, Guy's; Pratool Chandra Bhandari, Lahore and St. Thomas's; Maurice Bienenstock, Budapest; John T. Blackburn, Leeds; *Mary H. Y. Blakeston, Royal Free; Solomon Bloom, St. Bart.'s; Michael W. B. Bulman, London; William R. Carling, Cambridge and Guy's; Thomas H. Cathrall, London; Digby Chamberlain, Leeds; *Anaple Frances M. Christie, Royal Free; *Dorothy J. Collier, Oxford and Univ. Coll.; Macdonald Critchley, Bristol; Ahmed Mahmoud Deif, Cairo; John G. Drew, Cambridge and St. Thomas's; Alexander Cajetan D'Souza, Manchester; Mohammed Amin El-Biblawi, Cairo and Guy's; Alchonan Epstein, Birmingham; Riad Akhnookh Fanous, Manchester; *Betty Fletcher, Royal Free and St. Mary's; *Dora J. Fox and Naham Gallant, London; *Laura P. Gibbon, Oxford and London; Thomas J. E. Gittins, Birmingham; *Kate Glyn-Jones, London; Leslie D. Gorton, Birmingham; *Doris M. Hammond, St. Mary's; Basil J. Hancock and Rupert V. Hudson, Middlesex; Benjamin D. Hughes, St. Bart.'s; John W. Hulme, Middlesex and London; Fred C. Hunt, London; *Winifred M. Jenkins, Royal Free; Edmund M. Jones, St. Bart.'s; Reginald G. Karn, Univ. Coll.; Abdel Hamid Kassim, Guy's; John N. Kerr, St. Bart.'s; *Lorna Susan King, Royal Free and St. Mary's; Alfred T. L. Kingdon, Univ. Coll.; Arthur H. Kretchmar, Los Angeles and St. Bart.'s; Basil L. Laver, Guy's; Henry D. Llewellyn, Cardiff and St. Bart.'s; Alfred Q. Logan, St. Thomas's; *Caroline G. L. McHardy, Royal Free and London; Oswald E. J. McOustra, Univ. Coll.; *Frances M. Margerison, Charing Cross; Frank H. Mather, Cambridge and London; *Cecily M. E. Maude, Royal Free; George G. Michell, Univ. Coll.; *Mercli Philippa Middlemore, Royal Free; Rizk Mikhail, Charing Cross; *Iva Clare M. Molony, Royal Free and St. Mary's; *Rose Moss, Charing Cross; William H. Nettelfield, St. Bart.'s; Guillermo B. Oliva, Liverpool; Reginald E. Overton, Univ. Coll.; Gerald E. Peacock, Calcutta and King's Coll.; *Ruth E. Pilgrim, Royal Free and London; *Evelyn V. Pilley, St. Mary's; Francis L. Rayner, Guy's; Thomas R. Rees, St. Bart.'s; *Hilda E. Reynolds, Bristol; Edward H. Richards, Guy's; Henry R. Rishworth, Madras and Charing Cross; *Dorothy S. Russell, Cambridge and London; *Olive M. Salmon, St. Mary's; *Effie Frederike Amelia Samter, Manchester; Samuel Sandler, London; Cyril D. Shapland, Univ. Coll.; *Vera E. Shaw, St. Mary's; Kenneth E. Shellshear, St. Bart.'s; *Creina Shepherd, King's Coll.; Charles J. Slim, Birmingham; Luther J. Soutter, Westminster; *Eleanor C. E. Stone, St. Mary's; Louis W. Studdy, Durham; Synn Suvansa, St. Bart.'s; Ralph S. Swindell, William Thomas, and Douglas D. C. Thomson, London; Henry Tothill, St. Bart.'s; Bernard G. Watson, Birmingham; Estlin H. Weatherall, St. Bart.'s; Arthur D. Wright, St. Mary's; William A. Young, Oxford and St. Thomas's. * Under the Medical Act, 1876.

DIPLOMA IN OPHTHALMIC MEDICINE AND SURGERY.

This Diploma has been granted to:—

Tajammul Ahmed, Calcutta and Roy. Lond. Ophth. Hosp.; Ramrao Narayam Ajinkya, Bombay and Roy. Lond. Ophth. Hosp.; Henry W. Beedham, Cambridge, London, and Roy. Lond. Ophth. Hosp.; Clarence F. Eminson, Charing Cross and Roy. Lond. Ophth. Hosp.; Phiroze Jamshedji Kolapore, Guy's and Roy. Lond. Ophth. Hosp.; Alan North, Sydney, Roy. Lond. and Roy. Westm. Ophth. Hosp.; Charles H. St. John, Guy's and Roy. Lond. Ophth. Hosp.; Francis R. B. Skrimshire, St. Thomas's and Roy. Lond. Ophth. Hosp.; Stanley P. Sykes, Liverpool and Roy. Lond. Ophth. Hosp.; Thomas H. Vickers, St. Mary's and Roy. Lond. Ophth. Hosp.; and Harold S. Vivian, Middlesex and Roy. Lond. Ophth. Hosp.

ROYAL COLLEGE OF PHYSICIANS OF EDINBURGH, ROYAL COLLEGE OF SURGEONS OF EDINBURGH, AND ROYAL FACULTY OF PHYSICIANS AND SURGEONS OF GLASGOW.—The following have been successful in recent examinations:—

THIRD EXAMINATION.

Minnie E. McMurray, Akinlawon Adefolu, James Kirkness, and David Isaacs.

Pathology.—Alexander J. Sutherland, Jonathan Johan du Pre le Roux, Nicholas Johannes Laubscher, and Ronald H. Mackintosh.

Materia Medica.—Daniel T. Gemmell, Donald M. Gray, Edward N. Jamieson, Alexander H. Forman, James Courtney, Adam S. Gordon, Myer Goldberg, and Archibald Menzies.

FINAL EXAMINATION.

James B. Hendry, Ian Fleming McAsh, Enid Ann Williams, Dominic Ciantar, Raymond Levey, Edward J. Allan, Samuel Sieff, Noel Kretzmar, Leonard E. Murray, Sidney Sack, William T. Davie, George McCoull, Alexandra M. Limont, George H. Dobbin, James Readdie, John A. Nel, Alexander MacPherson, James H. Dobbin, Andrew M. Samarasinghe, Arthur S. Wickremesinghe, Jemima M. McKechnie Calder, John R. Williams, Arthur R. Lambie, Parmanand Madan, John R. McCubbing, Mohamed Shafie Hassen, Edward Spence, and James L. L. Jones.

Medicine.—Charles W. de Villiers-Pritchard, Max G. L. Lucas, William M. Reid, Frederick P. Lisboa-Pinto, and Henry G. F. Cubitt.

Surgery.—Max G. L. Lucas, William M. Reid, Charles T. Williams, Isobel Reid, and Salomon Ho Asjoe.

Midwifery.—Wilson O. Rodrigo, Charles W. de Villiers-Pritchard, Max G. L. Lucas, Charles T. Williams, Isobel Reid, James R. Colvin, Henry G. F. Cubitt, Salomon Ho Asjoe, Agnes Thyra Martin, and Duncan R. Nicol.

Medical Jurisprudence.—Henry G. Triay, Patel Shankerlal Hathibhai Masters, William Paris, Raymond L. A. Kitchen, Cecil Siung, Thomas K. Maclachlan, Annie F. Perry, and Charles W. de Villiers-Pritchard.

HARVEIAN SOCIETY.—A clinical meeting will be held on Thursday, Feb. 9th, at St. Mary's Hospital, Praed-street, Paddington, at 4.30 P.M.

SOUTH-WEST LONDON POST-GRADUATE ASSOCIATION.—A lecture will be given at St. James Hospital, Balham, on Tuesday, Feb. 7th, at 4.30 P.M., by Dr. Hector C. Cameron on Some Aspects of Infant Feeding.

MIDDLESEX HOSPITAL MEDICAL SCHOOL.—Sir John Bland-Sutton will deliver an Emeritus Lecture on Tuesday, Feb. 7th, at 3 P.M., on the Choroid Plexuses of the Brain and Psammomas.

ROYAL INSTITUTION OF GREAT BRITAIN.—The Friday evening discourse on Feb. 10th will be delivered at 9 o'clock by Prof. W. D. Halliburton, F.R.S., the subject being "The Teeth of the Nation."

OUT-PATIENT MENTAL CLINIC IN BRISTOL.—Among other recent devlopments at the Bristol General Hospital the formation of an out-patient mental clinic is particularly deserving of note. It was initiated at the request of the Asylums Committee of the Bristol City Council, and is under the direction of Dr. J. V. Blachford, medical superintendent of the City Mental Hospital (at Fishponds). The purpose of the clinic is to treat cases of early mental disorder referred to its officers by members of the General Hospital staff and other members of the profession, and it is open on Monday afternoons.

RONTGEN SOCIETY.—A general meeting will be held on Feb. 7th, at 8.15 P.M., in the Institution of Electrical Engineers, Savoy-place, Victoria Embankment, London, W.C. The following papers will be read and the apparatus demonstrated: (1) A New High-Tension Generator for X ray and other work, by Mr. W. H. Wilson; (2) Canny Ryall Diathermy Apparatus, Ionostat, a New Iontoquantimeter, New X Ray Protective Material, by Mr. Howard C. Head; (3) the Taylor Jones Electrostatic Oscillograph, a New Design of Gold Leaf Electroscope, by Mr. H. E. Donithorne; (4) a New Boiling-Water X Ray Tube, by Mr. Cuthbert Andrews; (5) Diathermy Apparatus, by F. R. Butt and Co., Ltd.; (6) a New Model of X Ray Table, by Mr. E. E. Burnside. —The fifth Silvanus Thompson memorial lecture will be delivered by Sir Oliver J. Lodge, F.R.S., at the Institution of Electrical Engineers on March 21st.

INCORPORATED VERMIN REPRESSION SOCIETY.—The third annual dinner of this society was held at the Trocadero, Shaftesbury-avenue, W., on Jan. 25th, Dr. Nathan Raw, M.P., being in the chair. After the loyal toast had been given, Dr. Raw coupled the name of Sir James Crichton-Browne with that of the society for which he had done so much work. Dr. Andrew Balfour, replying, read a letter from Sir James Crichton-Browne, regretting his inability to be present on account of an attack of influenza. Mr. A. E. Moore (Hon. Director of the Society), called upon to address the gathering, expressed the opinion that no Act of Parliament had ever been so shamefully administered as the Rats and Mice Destruction Act, 1919. It was doubtful, he said, if anyone at the Ministry of Agriculture, apart from those whose power was compartmentally restricted, cared much about the question of noxious vermin, and now that the services of some of the best-informed members of the staff had been dispensed with, it was doubtful if the Ministry had any authority with the bodies it supervised in this respect. The attitude of the Government was in marked contrast with that of the Danish authorities, who had made of their rat campaign a national affair. The attitude of many local governing bodies was one of passive defiance, and the London County Council did nothing to prevent the use of the city sewers as a rat highway, thus rendering abortive local efforts to deal with the pest. The Act provided penalties for the harbouring of rats, but not for trafficking in them; deliberate re-infestation had been suspected in some instances where rats had been practically exterminated. It was high time the Government availed itself of the expert and organised assistance of the society, and pressed the strict carrying out of the terms of the Act. Prof. S. J. M. Auld gave the toast of "The Rats Act and its Administration," and proposed that the responsibility for the latter should be transferred from the Ministry of Agriculture to the Ministry of Health. Mr. T. M. Hovell pleaded for the retention of the factory and laboratory of the Rats Branch, with their staffs, pointing out that these institutions, although they supplied poisons cheaply, yet made a profit, which might well be devoted to propaganda. Col. the Hon. Cuthbert James, M.P., attributed public apathy in the matter of the rat pest to weariness of too much legislation in recent years, and deprecated the cry of economy in a connexion which entailed so much waste of foodstuffs and other merchandise. Prof. F. Hobday spoke of the diseases borne by rats, and mentioned that the animals had been suspected of assisting in the spread of influenza.

ROYAL NORTHERN HOSPITAL.—In order to avoid interference with the school hours of children attending the Borough of Islington Tuberculosis Dispensary at the Royal Northern Hospital, it has been decided to hold an extra session on Tuesdays, beginning next week. Admission (which will be strictly confined to school children) will be from 5.30 to 6.30 P.M.

THE LATE DR. A. C. CASSELLS.—Dr. Andrew Cooper Cassells, born in Edinburgh in 1891, died at the Sanatorium, Pietermaritzburg, Natal, on Dec. 19th. Dr. Cassells qualified M.B., Ch.B. at St. Andrews in 1915, and subsequently held appointments as assistant medical officer, Cranham Lodge Sanatorium, Stroud, and resident medical officer at the Grampian Sanatorium, Kingussie. During the war he served with the R.A.M.C. in India and Mesopotamia. About 18 months ago he settled at Kokstad, East Griqualand, and was building up a large practice there when failing health compelled him to stop work some four months ago. He was popular in Kokstad, and much sympathy is felt there for his widow and her two young children.

DONATIONS AND BEQUESTS.—Under the will of the late Lord Mount Stephen, the full details of which have just been published, some £750,000 have been left for hospitals. The bequests include £10,000 to Dr. Barnardo's Homes and, on the falling in of several annuities, at least three-quarters of a million to King Edward's Hospital Fund for London. To his friend, Sir James Reid, Bart., Lord Mount Stephen has left £5000.—The Manchester Royal Infirmary has received the following legacies: £300 from the late Mrs. Sarah Emily Gurden, and £265 from the late Mr. James Hancock; also donations of £319 from the Radcliffe Glossop Hospital Committee, £157; and £52 10s. from "C" Division of the Manchester City Police to endow a bed, and other subscriptions amounting to over £140.

THE LATE DR. G. C. BRIGHT.—Dr. George Charles Bright, who died at Chalet Magali, Cannes, on Jan. 21st, was the youngest and last surviving son of Dr. Richard Bright whose name is for ever commemorated by the term "Bright's disease." Born in 1840 he was educated first at Rugby, where he had a brilliant career, and afterwards entered at Balliol, Oxford, where he graduated B.A. with first-class honours in natural science in 1863, M.B. in 1867, and M.D. in 1875. He also studied at Edinburgh and Paris and became successively house physician at St. George's Hospital, where he had been a student and later demonstrator of physiology and lecturer in comparative anatomy at the medical school. He became a Member of the Royal College of Physicians of London in 1868 and a Fellow in 1879. At Cannes, where he settled owing to the health of his wife, he had a large medical practice for nearly 50 years. One of the subjects in which he was particularly interested, and in which he made some of the earliest researches, was the condition of air in hospital wards. Dr. Bright was a man of wide sympathies and endeared himself to all whom he met; no mean performer on the violin, he was also like his father an artist and was interested in print and stamp collecting, and in fishing. He leaves a widow and three daughters. His last surviving brother Dr. Frank Bright, the historian, died in 1920.

PEMBROKE PORT AUTHORITY AND INFECTIOUS DISEASES.—On Jan. 10th Pembroke Town Council received the report of Dr. F. L. Keith, M.O.H. for the borough, on the question of reception and treatment at Jacobs Pill of certain cases of infectious disease handed over by the port sanitary authority. Dr. Keith said that after consultation with Dr. H. O. Williams, port medical officer, he was able to state that no cases from the port had required admission to an isolation hospital during the past 20 years, except naval cases of measles and German measles in the war period. Dr. Keith went on to say that the number of beds likely to be required for patients forwarded by the port authorities was, therefore, not great, but that under the Port Sanitary Authorities (Infectious Diseases) Regulations (1920) infectious diseases were defined as "any epidemic or acute infectious disease"; if the port sanitary authority wished to provide for cases other than those of scarlet fever and diphtheria—particularly cases of diseases spread by vermin, for which means of disinfection would have to be provided—then it would be advisable to review the present accommodation at Jacobs Pill. There was available accommodation for five adults; this was under the advised minimum for the population served, and only one type of disease could safely be treated at a time, owing to the disposition of wards. Lavatory, bathroom, and disinfecting equipment were all inadequate. Various alterations, involving an expenditure of about £2000, were suggested; the Council decided, after discussion, to call a special hospital committee. A motion was agreed to offering the premises to the recognised authority as they at present stood, provided the authority would be satisfied with the accommodation as a temporary measure.

ROYAL BRITISH NURSES' ASSOCIATION.—On Saturday, Feb. 4th, at 3 P.M., Sir D'Arcy Power will lecture at 194, Queen's Gate, London, S.W. 7, on the Evolution of Surgery, Dr. A. J. Rice-Oxley presiding. There will be no charge for the lecture, which will be illustrated by lantern slides.

THE LATE DR. LOVEL MOSS.—Dr. Lovel Moss died in hospital at Gibraltar on Jan. 21th as a result of injuries received in an accident which took place on the 20th, when a car in which he was returning to his residence at Algeciras collided with a troop-train at a level crossing. Of the four other occupants of the car, Mrs. Moss and two chauffeurs were killed instantly, whilst Dr. Moss's sister-in-law also died in hospital four days later. Dr. Moss received his medical education at Manchester University, where he graduated M.B., Ch.B. in 1911, and M.D. in 1916. Between these dates he held a post as house-surgeon at Warrington Infirmary, and later spent two years in the navy, being mentioned in despatches. Taking the diploma of D.O. Oxf. in 1920, he practised as an ophthalmologist in Gibraltar and Algeciras.

ROYAL SANITARY INSTITUTE: CONGRESS AT BOURNEMOUTH.—The names of the principal officers of this congress to be held from July 24th to 29th next have now been issued. The President will be Major-General J. E. B. Seely, and sectional officers will be as follows:—Sanitary Science: President, Sir Arthur Newsholme; Recording Secretary, Dr. Charles Porter. Engineering and Architecture: President, Sir Henry Tanner; Recording Secretary, Mr. A. Saxon Snell. Maternity and Child Welfare, including School Hygiene: President, Sir George Newman; Recording Secretary, Dr. G. F. Buchan. Personal and Domestic Hygiene: President, Mrs. Muriel Lefroy. Industrial Hygiene: President, Mr. H. Gordon Selfridge; Recording Secretary, Dr. H. Joseph Cates. The officers for the conferences will be:—Representatives of Sanitary Authorities: President, Alderman J. E. Beale; Recording Secretary, Mr. A. F. Kidson. Medical Officers of Health: President, Dr. W. J. Howarth; Recording Secretary, Dr. T. W. Naylor Barlow. Engineers and Surveyors: President, Mr. Norman Scorgie; Recording Secretary, Mr. Edward Willis. Veterinary Inspectors: President, Mr. W. Woods, F.R.C.V.S.; Recording Secretary, Mr. J. R. Hayhurst, M.R.C.V.S. Sanitary Inspectors: President, Mr. W. G. Gooper, Chief Sanitary Inspector, Bournemouth; Recording Secretary, Mr. J. H. Clarke. Health Visitors: President, Prof. A. Bostock Hill; Recording Secretary, Miss L. M. O'Kell. A health exhibition, illustrating municipal sanitation and domestic health and comfort, will be arranged in connexion with the meeting. Visits will be arranged to places of sanitary interest. To those not connected with the institute, congress tickets will be issued at £1 11s. 6d. each. Ladies' tickets (not including copies of the proceedings), 10s. 6d. each. The Council invite papers on subjects relating to health and sanitary science. Authors should forward their manuscript by post as early as possible, and in any case not later than June 19th, addressed to the Secretary, The Royal Sanitary Institute, 90, Buckingham Palace-road, London, S.W. 1.

ROYAL MEDICAL BENEVOLENT FUND.—At the meeting of the committee held on Jan. 10th 18 cases were considered, and £181 voted to 14 applicants. The following is a summary of some of the cases relieved:—

Daughter, aged 66, of M.R.C.S. Eng. who practised in Sussex and died in 1896. Owing to diminishing income applicant finds it difficult to pay her way and asks the Fund for assistance. She received this last year £28 for copying work, £30 from dividends, and a Christmas gift of £5. Rent, light, and use of kitchen stove cost 14s. per week. Voted £18 in 12 instalments.

Widow, aged, 62, of L.R.C.P. Edin. who practised at Langley and died in 1909. Applicant receives boarders and is helped by a niece, and the last 12 months received £134 18s. Mortgage interest £26 and rates £53 7s. Applicant asks for help towards paying mortgage interest. Relieved 11 times, £110; last time £10, January, 1921. Voted £10.

Widow, aged 41, of M.R.C.S. Eng. who practised in Swansea and Liverpool and died in 1914. Owing to ill-health applicant is dependent upon her mother with whom she lives, and the education of her daughter is paid as follows: £6 from R.M.B.F. Guild, £10 from St. Anne's, and £5 from applicant's sister. Relieved by the Fund seven times, £90; last time £18 in 12 instalments, January, 1921. Voted £18 in 12 instalments.

Daughter, aged 69, of M.D. Edin. who practised in London and died in 1873. Applicant and her sisters are unable to meet their expenses and their income amounted to £127. Rent and rates £50 per annum. Relieved six times, £78; last time £18, January, 1921. Voted £18 jointly.

Daughter, aged 76, of M.R.C.S. Eng. who practised at Andover and died in 1869. She receives £25 from the R.U.K.B.A., £25 from the Governesses Benevolent Fund, £30 from Epsom, and £4 from a ladies' guild. As her means are insufficient to support herself and young nephew she asks the Fund for assistance. Relieved four times, £27; last time £12 in 12 instalments, December, 1919. Voted £5.

Widow, aged 80, of M.R.C.S. Eng. who practised at Devonport and died in 1875. Applicant's income is diminishing owing to some leases expiring, and this last year only received £41 from investments and £35 from a married daughter. Ground rent and repairs amount to £13, and her board and lodging cost £52 per annum. Relieved three times, £36; last time £12 in 12 instalments, December, 1920. Voted £12 in 12 instalments.

Daughter, aged 48, of M.R.C.S. Eng. who practised at Notting Hill and died in 1885. Through ill-health she is entirely dependent upon her sister. Relieved by the Fund five times; last time £10, April, 1920. Voted £10.

Subscriptions may be sent to the Hon. Treasurer, Sir Charters J. Symonds, K.B.E., C.B., F.R.C.S., at 11, Chandos-street, Cavendish-square, London, W. 1.

LONDON NEUROLOGICAL CLINIC.—The fourth annual dinner of this clinic, established by the Ministry of Pensions, was held at the Imperial Café, London, W. 1, on Jan. 28th, some 50 to 60 members and guests being present. Sir Maurice Craig and Dr. Henry Head were the guests of the evening. The health of the clinic was proposed by Dr. Danvers-Atkinson and responded to by the chairman, Dr. H. E. Davison, the medical superintendent of the clinic. Dr. Davison described the great increase in the activities of the institution during the past year. The total number of cases examined had been over 14,000 and the total number of treatments given 4000. Clinics on similar lines had been, or were being, established throughout the country. In reply to the toast of the guests, proposed by Dr. W. A. Brend, Sir Maurice Craig referred to the great development of psychotherapy during and since the war. There had never been a period in the history of psychological medicine when so much advance had been made. He congratulated the clinic on the excellent work which it had performed and hoped that it might eventually function on a more comprehensive basis. Dr. Henry Head referred appreciatively to his association with the clinic during the years 1917 and 1918. He referred to the difficulty which arose from the demand of the laity that the physician should be "pontifical," while the present state of our knowledge of psychotherapy often rendered this attitude impossible. The clinic was collecting observations and investigating the causes of neurotic disorders; from these efforts good results had accrued and would continue to accrue.

Medical Diary.

Information to be included in this column should reach us in proper form on Tuesday, and cannot appear if it reaches us later than the first post on Wednesday morning.

SOCIETIES.

ROYAL SOCIETY OF MEDICINE, 1, Wimpole-street, W.

MEETINGS OF SECTIONS.

Monday, Feb. 6th.

TROPICAL DISEASES AND PARASITOLOGY: at 8.30 P.M.
Communications:
Dr. J. B. Christopherson: Certain "Blue Bodies" seen in Leishmaniasis, with reference to diagnosis.
Dr. J. Forest Smith: An Analysis of Cases of Amœbic Abscess of Liver, admitted to St. Thomas's Hospital, from 1897–1921.
Dr. M. Khalil: The Morphology of the Cercaria of Schistosoma Mansoni from Planorbic Boissyi of Egypt.
Dr. F. J. Harper: Bilharziasis and the Danger of Infection in Clearing out the Canals in Egypt.

Tuesday, Feb. 7th.

ORTHOPÆDICS: at 4.45 P.M. Special General Meeting:—To receive Report of the President and Council upon the Formation of the Section of Orthopædics.
At 5 P.M. Clinical Meeting:—
Cases will be shown.
At 5.30 P.M.
Opening Address:
Mr. Laming Evans (President): Some Recent Advances in Orthopædic Surgery.
Discussion of Cases.

PATHOLOGY: at 8.30 P.M. At the National Institute for Medical Research, Mount Vernon, Hampstead, N.W. 3.
Communications:
Dr. J. H. Burn: Pilocarpine and Sweating.
Dr. H. H. Dale and Dr. C. H. Kellaway: Anaphylaxis and Anaphylatoxins.
Prof. Clifford Dobell: Exhibition of Specimens of Intestinal Protozoa of Man.
Captain S. R. Douglas, I.M.S.: (1) Method for Demonstrating *B. diphtheriæ* in Tissues. (2) Culture Medium for *B. diphtheriæ*.
Mr. W. J. Purdy: Sections from a Case of Hæmochromatosis.

Wednesday, Feb. 8th.

SURGERY: SUB-SECTION OF PROCTOLOGY: at 5.30 P.M. *Cases and Specimens* at 5 P.M. The following will be shown by
Mr. Lionel E. C. Norbury: (1) Case of Perforating Diverticulitis of Pelvic Colon, with Vesico-Colic Fistula—treated by Supra-Pubic Cystotomy and Transverse Colostomy. (2) Case of Malignant Polypus of Rectum;

Ligation and Removal—Subsequent Treatment with Radium, Signs of Local Recurrence, Perineal Excision of Rectum.
Sir Charles Gordon-Watson: Two Specimens of Diverticulitis of Pelvic Colon successfully removed by resection.
Mr. Hamilton Drummond: Sacculitis of Colon which gave rise to symptoms on right side. Removal of the right side of colon.
Communication:
Mr. W. B. Gabriel and Mr. J. P. Lockhart-Mummery: Case of a Second Primary Carcinoma of Colon.
Paper:
Mr. W. Ernest Miles: Adenomyoma of Uterus, invading recto-vaginal septum and pelvic colon (with specimen and microscopic slides).

Thursday, Feb. 9th.

NEUROLOGY: at 8.30 P.M.
Paper:
Dr. Farquhar Buzzard: Some Varieties of Traumatic and Toxic Ulnar Neuritis.

Friday, Feb. 10th.

CLINICAL: at 5.30 P.M. (Cases at 5 P.M.)
Cases: The following will be shown by:—
Dr. A. F. Hurst: Addison's Disease treated by Suprarenal Graft.
Mr. W. E. Tanner: Abscess of Lung.
Mr. R. P. Rowlands: Case Illustrating the Advantages of Cholecystectomy over Cholecystotomy.
Mr. E. O. Slesinger: Osteitis Deformans.
Dr. M. A. Cassidy: Auricular Fibrillation.
Members wishing to show other cases at this meeting are requested to communicate with the Junior Hon. Secretary as soon as possible.

OPHTHALMOLOGY: at 8.30 P.M.
Cases will be shown at 8 P.M.
Papers:
Miss I. C. Mann: On the Morphology of Certain Developmental Structures associated with the upper end of the choroidal fissure.
Dr. Henry J. May and Mr. F. A. Williamson-Noble: Three Cases of Choroidal Sarcoma with notes on the microscopic appearances.

MEDICAL SOCIETY OF LONDON, 11, Chandos-street, Cavendish-square, W. 1.
WEDNESDAY, Feb. 8th.—9 P.M., Second Lettsomian Lecture: Sir Leonard Rogers: Amœbic Liver Abscess: Its Pathology, Prevention, and Cure.

HARVEIAN SOCIETY OF LONDON, St. Mary's Hospital, Paddington, W.
THURSDAY, Feb. 9th.—4.30 P.M.: Clinical Evening.

ROYAL INSTITUTION OF GREAT BRITAIN, Albemarle-street, W.
THURSDAY, Feb. 9th.—3 P.M., Sir Napier Shaw: Droughts and Floods (2).
FRIDAY.—9 P.M., Prof. W. D. Halliburton: The Teeth of the Nation.

LECTURES, ADDRESSES, DEMONSTRATIONS, &c.

ROYAL COLLEGE OF SURGEONS OF ENGLAND, Lincoln's Inn Fields, W.C.
MONDAY, Feb. 6th.—5 P.M., Hunterian Lecture: Prof. Alan H. Todd: Orthopædic Aspects of Rheumatoid Arthritis.
WEDNESDAY.—5 P.M., Hunterian Lecture: Prof. A. G. Timbrell Fisher: A Research into the Pathology and Ætiology of Osteo-arthritis, with Observations upon the Principles Underlying its Treatment.
FRIDAY.—5 P.M., Hunterian Lecture: Prof. C. A. Pannett: Hydronephrosis.

MIDDLESEX HOSPITAL MEDICAL SCHOOL (University of London), Berners-street, W.
TUESDAY, Feb. 7th.—3 P.M., Emeritus Lecture: Sir John Bland-Sutton: Choroid Plexuses of the Brain and Psammomas.

WEST LONDON POST-GRADUATE COLLEGE, West London Hospital, Hammersmith, W.
MONDAY, Feb. 6th.—5 P.M., Dr. Arthur Saunders: Syphilis and Tubercle of the Liver.
TUESDAY.—5 P.M., Mr. Addison: Tumour of Bone.
WEDNESDAY.—5 P.M., Mr. Donald Armour: Practical Surgery (1).
THURSDAY.—5 P.M., Sir John Collie: Medico-Legal Aphorisms. (Open to all Medical Practitioners.)
FRIDAY.—5 P.M., Mr. MacDonald: Enlarged Prostate.
SATURDAY.—10 A.M., Dr. Burnford: Visit to Medical Wards.
Daily:—10 A.M., Visit of Post-Graduates to Wards. 2 P.M., In-patient, Out-patient Clinics and Operations.

SOUTH-WEST LONDON POST-GRADUATE ASSOCIATION, St. James's Hospital, Balham.
TUESDAY, Feb. 7th.—4.30 P.M., Dr. Hector Cameron: Some Aspects of Infant Feeding.

NORTH-EAST LONDON POST-GRADUATE COLLEGE, Prince of Wales's General Hospital, Tottenham, N. 15.
MONDAY, Feb. 6th.—3.30 P.M., Dr. L. Yealland: Examination of the Nervous System: (1) Cranial Nerves.
TUESDAY.—2.30 P.M., Dr. J. Metcalfe: X Ray Examination: (1) Chest Diseases.
THURSDAY.—4.30 P.M., Mr. H. W. Carson: Intestinal Obstruction (1).
Daily:—2.30 P.M., In-patient and Out-patient Clinics, Operations, &c.

NATIONAL HOSPITAL FOR DISEASES OF THE HEART POST-GRADUATE COURSE, Westmoreland-street, Marylebone, W.
MONDAY, Feb. 6th.—5.30 P.M., Dr. Parkinson.
Daily:—10 A.M. and 2 P.M., Out-patients and In-patients.

NATIONAL HOSPITAL FOR THE PARALYSED AND EPILEPTIC POST-GRADUATE COURSES, Queen-square, W.C.
MONDAY, Feb. 6th.—12 noon, Dr. Greenfield: Reactionary Changes in the Central Nervous System. 2 P.M., Dr. Hinds Howell: Out-patient Clinic. 3.30 P.M., Dr. Aldren Turner: Paraplegia (1).
TUESDAY.—2 P.M., Dr. Grainger Stewart: Out-patient Clinic. 3.30 P.M., Dr. Risien Russell: Disseminated Sclerosis (1).
THURSDAY.—2 P.M., Dr. Kinnier Wilson: Out-patient Clinic. 3.30 P.M., Dr. Bailey: Muscle Testing by Electrical Methods.
FRIDAY.—2 P.M., Dr. Gordon Holmes: Out-patient Clinic. 3.30 P.M., Mr. Sargent: Pituitary Tumours.

HOSPITAL FOR SICK CHILDREN, Great Ormond-street, W.C.
THURSDAY, Feb. 9th.—4 P.M., Dr. Langmead: Anomalous Œdemas.

ST. JOHN'S HOSPITAL FOR DISEASES OF THE SKIN, 49, Leicester-square, W.C.
THURSDAY, Feb. 9th.—6 P.M., Chesterfield Lecture:—Dr. W. Griffith: The Skin Eruptions of Syphilis.

ST. MARYLEBONE GENERAL DISPENSARY, 77, Welbeck-street, Cavendish-square, W.
Post-Graduate Course on Infant and Child Welfare.
WEDNESDAY, Feb. 8th.—6 P.M., Dr. Eric Pritchard: Causes of Infant Mortality.
FRIDAY.—How to Conduct an Infant Consultation and Keep Records.

BRITISH MEDICAL ASSOCIATION (CHESTERFIELD BRANCH) POST-GRADUATE COURSES.
FRIDAY, Feb. 10th.—(At Chesterfield Royal Hospital Board Room) 2.30 P.M., Prof. Connell: Fractures. 3.15 P.M., Dr. Hallam: Skin Diseases in Infancy.

MANCHESTER ROYAL INFIRMARY POST-GRADUATE CLINIC.
TUESDAY, Feb. 7th.—4.30 P.M., Dr. F. C. Moore: Flatulent Dyspepsia.

ST. MARY'S HOSPITALS POST-GRADUATE LECTURE, Whitworth-street West Branch, Manchester.
FRIDAY, Feb. 10th.—4.30 P.M., Dr. Fletcher Shaw: The Toxæmias of Pregnancy.

MANCHESTER FRENCH HOSPITAL, POST-GRADUATE LECTURES, 24, Acomb-street, Whitworth Park.
THURSDAY, Feb. 9th.—4.30 P.M., Twilight Sleep. (Open discussion.)

SALFORD ROYAL HOSPITAL.
THURSDAY, Feb. 9th.—4.30 P.M., Dr. Bythell: X Ray Diagnosis of Chest Lesions.

ROYAL INSTITUTE OF PUBLIC HEALTH, 37, Russell-square, W.
Lectures on Tuberculosis and Public Health.
WEDNESDAY, Feb. 8th.—4 P.M., Dr. Louis Cobbett: The Rôle of the Three Types of Tubercle Bacilli in Human and Animal Tuberculosis.

PEOPLE'S LEAGUE OF HEALTH, Royal Society of Arts, John-street, London, W.C. 2.
Course of Lectures on the Mind and What We Ought to Know About It.
MONDAY, Feb. 6th.—6 P.M., Dr. Bernard Hart: Primitive Instinct.

Appointments.

London Homœopathic Hospital, Bloomsbury: MACGOWAN, A., M.B., Ch.B. Glasg., Assistant Physician; and BOWIE, A., M.B., C.M. Edin., Medical Officer in Charge of the Electro-Therapeutical Department.
Royal Infirmary, Manchester: BYRD, J. D., M.R.C.S., L.R.C.P. Lond., Assistant Medical Officer. LLOYD, B. L., M.B., Ch.B. Vict., Resident Medical Officer, Barnes Convalescent Home. MARTIN, MARGARET B., M.B., Ch.B. Edin, Senior Medical Officer, Central Branch. CHADWICK, V., M.B., Ch.B. Vict.; POWELL, W. E., M.B., Ch.B. Vict.; EMMETT, H. E., M.B., Ch.B. Vict.; and WATERWORTH, S., M.B., Ch.B. Vict., House Physicians. WILLIAMSON, R., M.B., Ch.B. Vict., Senior House Surgeon, Special Departments. ASHCROFT, G. V., M.B., Ch.B. Vict.; and POTTER, L., M.B., Ch.B. Vict., Senior House Surgeons. MARTLAND, W. L., M.B., Ch.B. Vict.; GERAGHTY, W., M.B., Ch.B. Vict.; CRAIG, N. S., M.B., Ch.B. Vict.; DUTHIE, O. M., M.B., Ch.B. Vict.; and BUCKLEY, G. H., M.B., Ch.B. Vict., Junior House Surgeons.
Certifying Surgeons under the Factory and Workshop Acts: COX, G. R., M.R.C.S., L.R.C.P. Lond (Winchcomt); FENNELL, T. L., M.B., Ch.B. Vict. (Knutsford); LAURENCE, G., F.R.C.S. Edin., M.R.C.S., L.R.C.P. Lond. (Chippenham).

Vacancies.

For further information refer to the advertisement columns.
Aberdeen Royal Infirmary.—Asst. P.
Belgrave Hospital for Children, 1, Clapham-road.—H.P. and H.S. Each £100.

Charing Cross Hospital.—Asst. S.
Chesterfield and North Derbyshire Royal Hospital.—Jun.H.S. £175.
Coventry and Warwickshire Hospital.—Res. H.P. £200.
Dudley, Guest Hospital.—Asst. Res. M.O. £150.
Eday, Orkney, Parish Council.—M.O.
Galway, Central County Hospital.—Phys. £600.
Gloucester County Mental Hospital.—Jun. A.M.O. £350.
Hereford.—County M.O.H. £700.
Hospital for Consumption and Diseases of the Chest, Brompton.—Asst. in Dept. Path. £250.
Hospital for Women, Soho-square.—Res. M.O. £100.
Ipswich, East Suffolk and Ipswich Hospital.—Asst. P. and Hon. Anæsth.
Johannesburg, University College.—Prof. of Anatomy. £1000.
Manchester Children's Hospital, Gartside-street.—Asst. M.O. £200.
Manchester Children's Hospital, Pendlebury.—Res. M.O. £150.
Middlesex Hospital, W. 1.—Asst. Radiologist. £200.
Mount Vernon Hospital for Tuberculosis, &c.—Radiologist. £150.
National Hospital for the Paralysed, &c., Queen-square.—Asst. Surg. to Ear, Nose, and Throat.
Newcastle-upon-Tyne, City Hospital for Infectious Diseases.—Med. Asst. £350.
Paisley, Royal Alexandra Infirmary.—Pathologist. £500.
Plymouth, S. Devon and E. Cornwall Hospital.—Hon. Anæsth.
Poplar Hospital for Accidents, Poplar, E.—Asst. Res. S. £150.
Queen's Hospital for Children, Hackney-road.—Res. M.O. £200.
Royal Chest Hospital, City-road.—P.
Royal Free Hospital, Gray's Inn-road, W.C.—Clin. Assts.
Royal Waterloo Hospital, Waterloo-road, S.E.—Cas. O. £150.
Ryde, Royal Isle of Wight County Hospital.—Res. H. S. £200.
St. George's Hospital, S.W.—Res. Asst. S. £350.
St. Marylebone Hospital, Ladbroke-grove.—Consulting Neurologist. £100.
Seamen's Hospital, Albert Dock.—H.S. £150.
Shrewsbury, Royal Salop Infirmary.—H.S. £275.
Society for the Propagation of the Gospel.—Med. Man. £400.
University of London.—Examiners. Prof. of Surgery. £2000.
Ventnor, Royal National Hospital for Consumption.—Asst. Res. M.O. £300.
Western Australia, Lunacy Department.—Sen. Asst. M.O. £504. Jun. Asst. M.O. £432.
Western Dispensary, Westminster.—Dentist.
Weston-super-Mare Hospital.—H.S. £150.

The Chief Inspector of Factories announces the following vacant appointments: Cardiff (Glamorgan), Keighley (Yorks, West Riding), Market Bosworth (Leicester), Wadebridge (Cornwall).

The Secretary of State for the Home Department gives notice that he proposes to appoint a physician to be an additional Medical Referee under the Workmen's Compensation Act, 1906, for County Court Circuit No. 32. This circuit comprises the County Courts of Attleborough, Aylsham, Beccles and Bungay, Downham Market, East Dereham, Fakenham, Great Yarmouth, Harlestone, Holt, King's Lynn, Lowestoft, North Walsham, Norwich, Swaffham, Thetford, and Wymondham. Applications for the post should be addressed to the Private Secretary, Home Office, and should reach him not later than Feb. 21st, 1922.

Births, Marriages, and Deaths.

BIRTHS.

BELL.—On Dec. 27th, 1921, at Colaba War Hospital, Bombay, the wife of Major W. J. E. Bell, D.S.O., R.A.M.C., of a son.
BRIERLEY.—On Jan. 6th, at Peshawar, the wife of Major C. I. Brierley, I.M.S., of a daughter.
DUPONT.—On Jan. 28th, at Bridge House, Frome, Somerset, the wife of Dr. Dupont, of a son.
MILLER.—On Jan. 21st, at Abercorn-place, N.W., the wife of Dr. Reginald Miller, F.R.C.P., of a daughter.
WOODMAN.—On Jan. 26th, at Hagley-road, Edgbaston, Birmingham, the wife of E. Musgrave Woodman, M.S., F.R.C.S., of a son.

MARRIAGES.

HULBERT—BARDSLEY.—On Jan. 25th, at the Vice-Consulate, Cannes, and afterwards at St. John's Church, Grasse, Henry Louis Powell Hulbert, M.D. Cantab., D.P.H., to Edith Wareing, youngest surviving daughter of the late John Wareing Bardsley, Bishop of Carlisle, and the late Mrs. Bardsley.

DEATHS.

BRIGHT.—On Jan. 21st, at Chalet Magall, Cannes, Dr. G. C. Bright, F.R.C.P., youngest and last surviving son of Dr. Richard Bright, aged 81.
MOSS.—On Jan. 24th, at the Colonial Hospital, Gibraltar, from injuries received, Lovel Moss, M.D., D.O. Oxon.
OSBORNE.—On Jan. 28th, in London, Alexander B. Osborne, M.D., Lt.-Col., C.A.M.C., of Hamilton, Ontario, aged 59 years.
OSBURNE.—On Jan. 24th, at The Grove, Old Catton, Norwich, and of Lindville, Cork, Ireland, Cecil A. P. Osburne, F.R.C.S.E., aged 66 years.
PEDLEY.—On Jan. 13th, 1922, at Bridge House, Rangoon, suddenly, of heart failure, Thomas Franklin Pedley, M.D., V.D., K.I.H., eldest son of the late George Pedley, of The Haven, Sutton, Surrey, aged 67. (By cable). R.I.P
WILLAN.—On Jan. 27th, at Littlehampton, Thomas Henry Willan, M.R.C.S., L.S.A., aged 82 years.
WILLIAMS.—On Jan. 29th, at his residence, Branksome Chine House, Bournemouth, Charles Edward Campbell Williams, M.A., M.D.

N.B.—A fee of 7s. 6d. is charged for the insertion of Notices of Births, Marriages, and Deaths.

Notes, Short Comments, and Answers to Correspondents.

SOME POINTS ON THE PROBLEMS OF THROAT AND EAR DISEASE IN SCHOOL CHILDREN.[1]

BY T. B. LAYTON, *D.S.O.*, M.S. LOND., F.R.C.S. ENG.,
THROAT AND EAR SURGEON TO THE L.C.C. CLINIC OF ST. GEORGE'S DISPENSARY, S.E., AND TO GUY'S HOSPITAL.

LOOKING back over the history of medicine in the last 50 years we see that the surgical aspect of the subject has become dominated by the knife to such an extent that for some of the younger members of my profession to be a good operator is to be a good surgeon. There is now hardly any part of the human body upon which an operation cannot be done with safety or, at any rate, with reasonable expectation of recovery, as a result of this relative safety. Operations are advised without that great consideration which was given 20 years ago to every aspect of a case before any cut was made. We may admire the courage of those, many of them still alive, who first performed these operations; but nowadays it often needs more courage to refrain from operating than it does to operate. It is to the future rather than to the past that I would refer to-day; I only draw attention to the past because I believe that a change, already begun, will become increasingly noticeable within the next ten years. The first signs of it were seen before the war, but I think that the war hastened the development of our ideas in this as in so many other things. I believe that the surgeon of the future will delight not in the number of his operations nor in their magnitude, but in the way that he selects the cases in which a favourable result will follow, and by the way in which he saves some major operation by the timely performance of a minor one.

Need for Team-work.

He will deal rather with the problem than with the case, and a problem cannot be dealt with single-handed; it must be tackled by a large number of people from many points of view. A single doctor may deal with a difficult case of giddiness arising in the course of ear disease, but it needs the coöperation of many persons belonging to many professions and occupations even to realise how great a problem is that of discharging ears in a vast city such as ours. If my ideals of the future of surgery are correct we need your help to an extent which increases daily, and if we need your help we must tell you wherein we need it. In my own branch of surgery two vast problems well illustrate these points—the problems of tonsils and adenoids, and of running ears. The first is an example of the need for selection of cases in which a favourable result will follow, and the second an example that we should delight in the possibility of dispensing with major operations.

The Individual Patient and the Scientific Problem.

But before we consider these I would deal with a conceivable misapprehension, it is that the case and the patient is one and the same thing. To approach a medical subject from the standpoint of a problem rather than from that of an isolated case does not infer that one loses interest in the patient or patients. In my experience it is the opposite. If an accusation of want of interest in the individual can ever be made against a doctor, it will be made against the man who centres his interest upon the scientific side of a special case. A wide interest in a great medical problem usually goes with an intense desire to improve the condition of the people as a whole, and with an innate sympathy with the patients in particular.

Tonsils and Adenoids.

It would be quite impossible for me to deal adequately with either of these problems in a single address. I can only put before you the chief aspects of the former and lay down the broad outlines of what I conceive to be the way that you can help us. I am one who believes that far too many operations are done upon tonsils and adenoids in children, especially in the public work of hospitals and school clinics; and I believe this is so, when they are done by general practitioners or by general surgeons, even more than when done by specialists. I put this view forward in March, 1914.[2] Four and a half years away from special

[1] An address delivered on Jan. 26th, 1922, to members of the Invalid Children's Aid Association and of the Care Committees of L.C.C. Schools.
[2] THE LANCET, 1914, i., 1106.

work gave me an opportunity to reconsider my opinion. From what I have heard and seen and read in the last three years I can find no reason to alter it again. How, then, are we to proceed under the circumstances? We want first to get rid of the idea that the lymphoid tissue of the pharynx is a useless structure which can be removed on mere suspicion without doing any harm. Then due consideration will be given to its loss to the body. To say that the tonsils are only normal when they are inflamed may seem a paradox, but it is true. They form a part of the first line of defence to the entrance of organisms to the body in a very large number of diseases. Now inflammation is no disease, but a physiological reaction of the body to some harmful thing that is trying to gain admittance to it. Hence, every time we see a tonsil inflamed we have to think not only of the local changes, but whether there are any general factors so causing a lowering of resistance that the local structures have a greater strain thrown upon them than they should be called upon to bear. This will make us consider the hygiene of the child's life. Housing, clothing, ventilation, ablutions, feeding, exercise, habits of life, and habits of mind. By correction of errors of one or more of these so much may be done to raise the resistance of the body that the symptoms in the throat will often disappear.

The Ideal Clinic.

It is here that we need your help. The ideal clinic would be that in which the surgeon could at once turn to someone who could give sound evidence on all these points in every case in which he needed it, and in which he had by his side some sympathetic person who can repeat his advice to the parent in the privacy of the home showing how it could be carried into the practical details of the household. To give such reports you would need great judgment, for upon them very largely his action should depend. There are some children living in the slums of our poorer districts in whom an operation upon tonsils and adenoids will never give a good result. These cases form a problem social rather than medical. They are, I believe, more numerous than we realise, and they are, I believe, increasing as urban life becomes more complex. For this reason I think the housing problem was rightly put under the Ministry of Health.

Enlarged Tonsils and Disease.

Next we want to get rid of the term "enlarged" tonsils as an indication for their removal. I maintain that we should never remove a tonsil because it is enlarged. We should remove it because it is diseased, but its enlargement is a sign that it is performing its normal functions of the destruction of micro-organisms. I will admit that many enlarged tonsils are also diseased. We have then to consider whether the harm done to the body by the disease in the tonsil is greater than the good done by the enlargement of the tonsil before we decide to remove the latter. I believe that the removal of tonsils for mere enlargement without considering whether there be also signs of disease is the most fertile cause of excess of operations to-day. But when I tell you that the inflamed tonsil is the normal tonsil it may reasonably be asked what I mean by disease of the tonsil. I mean that organisms are living and developing in the tonsil so that they or the poisons they form can either extend out into the throat and cause trouble there or by being absorbed into the body give rise to some general disturbance. This is what we mean when we say that the tonsils are a source of sepsis. I do not propose to detail to you the evidence upon which we judge this, but some points in the history will often help. One often hears that a child has frequent colds and that when he gets them it always flies to the throat. This child may be suffering from a cold caught by inspiration of organisms in the way that many people are now catching influenza, and the inflammation may have extended down from the nose to the throat, or the child may be falling time and again a prey to its own microbes living in the tonsils. In the latter case a careful history will reveal that the sore throat comes first and the ill-feeling later; in the former the reverse is the case, and then attention to hygiene is more likely to benefit, whilst in the latter the tonsils may have to come out; and this history will be one piece of evidence upon which the decision will be made. In obtaining this history care must be taken not to put leading questions. Many people will give the answer implied in your question. Some are mentally lazy and will not examine their thoughts, some want to ingratiate themselves with you, some want to get rid of you as soon as possible, and some have their minds so constituted that they absorb suggestions as a sponge does water. Therefore study the people whom you question, and always doubt your own power of getting a correct answer. And thirdly, we want to get rid of the assumption that when the symptoms return after an operation upon adenoids that the operation has been badly done. I would rather infer that the lymph tissue of which the adenoids is an enlargement is a need to the person and that we must find some other way of treating the child than by its repeated removal.

I would not have you think that because I believe too many operations are now done that no operations on tonsils and adenoids should be done at all. I know of no operation in surgery; nay, more, I know of no method of treatment in medicine from which more striking results may be obtained than from the efficient removal of tonsils and adenoids in properly selected cases. It is by improper selection and by regarding the operation as a panacea that harm is done and discredit brought upon the method of treatment. That such discredit is rife is shown by the fact that other persons with other panaceas are cropping up. Each has his or her method advertised in a pamphlet sold on the public bookstalls which advocates some treatment that will infallibly cure adenoids. It is because of their panaceas that I disagree with them. Some of the children suffering with symptoms of lymphoid enlargement of the naso-pharynx are suffering from a general disease or a general lowering of health, and others are suffering from a local disease. It is as wrong to treat all by general methods as it is to submit them all to operation.

Advice to Health Visitors.

It is one of your duties to persuade the parents to take the doctor's advice. When this is moderate and based upon due consideration you will seldom have any difficulty. When you have difficulty do not try to do too much at once, never let the parents see you are annoyed, and never threaten. Under the Children Act I believe it is possible to summons parents for refusal to have an operation done. If this is so it must be sparingly used. I have never yet had a case of refusal in which I was prepared to go into court in support of such a summons. If you do not intend to carry out a threat never threaten. Therefore your persuasion must be entirely by reasoning with the parents. Remember that theirs is the ultimate responsibility. Valuable as I believe the medical inspection and treatment of school children to be, there is the danger of diminution of the parent's responsibility. Therefore, when you are refused admittance be not offended. The Englishman's home is his castle, and those very persons who refuse your help may be those with the highest sense of a parent's duty. With politeness and with sympathy you will seldom fail to win them round. There is a greater danger from the parents who meekly submit to the ruling of the doctor.

If you have no sympathy with the poor, give up this work. If you think that every dirty child is a miscreant, if you think that every mother should be punished if her children are not clean, find something else to do. Cleanliness may be next to godliness, or a part of it; but it is expensive and very difficult to attain among the poor. If you point out to a South East London mother that her daughter has some of those nasty little things in the head and ask whether she would like her to go to the medical baths you will seldom have a refusal; but if you tell her the child is verminous and order her to the cleansing station you will always have trouble. And besides sympathy on your part we need reasoning powers on theirs; and we can only get that by education. We spend money now quite rightly upon the Ministry of Health, but in the ultimate raising of the health of the nation that spent upon the Ministry of Education will tell far more effectually; and you who work where these two meet have work which is not seen by the public but which has an importance that is only as yet beginning to arise.

SCIENTIFIC PIG KEEPING.

To the Editor of THE LANCET.

SIR,—I find that of the large number of medical men who have of late taken up agriculture few take advantage of recent research work in relation to vitamins. For the last two years I have been experimenting largely in the field of animal nutrition and have been able to save £1500 in my feeding costs during this last year by feeding my animals on foods known to contain these food accessories. The following biochemical experiment which I carried out over a period of five weeks shows how marked is the effect of vitamins on absorption.

Nine pigs, which had just been weaned, were chosen for the test, and were divided into three pens. Pen No. 1 were fed on 20 per cent. food, which I had prepared, containing, as shown by the rat-feeding test a sufficient quantity of the fat-soluble vitamin A and vitamin B along with the essential salts. The protein value was 54 per cent.; to this was added 80 per cent. of ground oats and barley. Pen No. 2 were fed on coconut cake containing the same amount of protein as Mixture 1, along with ground oats and barley. Pen No. 3 were fed similarly to pen No. 2, except that palm kernel took the place of coconut cake. At the end of five weeks, Pen No. 1 had increased by 143 lb., pen No. 2 by 78 lb., and pen No. 3 by 40 lb.

These experiments confirm the latest research work. I am indebted to my friend Dr. J. C. Drummond, D.Sc., for having so kindly given me his valuable assistance.

I am, Sir, yours faithfully,

Nash Farm, Keston, Kent. M. J. ROWLANDS.

THE PROGRESS OF SURGERY.

"The purchase of Erichsen's Science and Art of Surgery, ninth edition, 1888, at the price of 4*d.* per volume, on the stall of a second-hand bookseller provokes reflection," writes a medical man, and even to the layman it should afford evidence of the great progress which surgery has made since the discovery of anæsthesia and the development of bacteriology. There can be only one reason why the great work of Erichsen, one of the most distinguished literary exponents of surgery in the middle of the last century, should now be sold practically as waste paper, and that reason is that rapid progress in the science and art of which he wrote has rendered his teachings out of date. Sir John Eric Erichsen was born in 1818 and died in 1896, and published the first edition of his Science and Art of Surgery in 1853, replacing thereby Samuel Cooper's "Very Bible of Surgery." The Science and Art of Surgery remains a monument to Erichsen's name; it went through 10 editions and was translated into nearly every European language, while America paid the author the compliment of pirating the book wholesale in the days when copyright regulations were rudimentary; for an edition was issued by the American Government to every medical officer in the Federal Army during the American Civil War.

COLONIAL HEALTH REPORTS.

BECHUANALAND PROTECTORATE.—ST. HELENA.

Bechuanaland Protectorate.—In his report for the year ended March 31st, 1921, Mr. R. M. Daniel, acting Government Secretary, states that the general health conditions throughout the territory were fairly good, and not marked by any special prevalence or severity of disease. There was an entire absence of epidemics, including small-pox and influenza, and no unusual outbreaks of malaria occurred. There was, notwithstanding, an increase in the aggregate of cases of disease treated. This was partly due to the extension of the medical service, and partly to a growing appreciation of the benefits of curative and preventive treatment on in-stations, an increase which is likely to continue with improved facilities. Two medical officers have been appointed, at Francistown and Serowe, within the period under review; and two dispensaries, intended for the free treatment of venereal diseases, are in course of construction at the Stads of Kanye and Molepolole. With the facilities thus provided, a considerable mass of the native population will shortly be brought within the reach of efficient medical treatment. The rainfall for the year was 25·52 inches—considerably above the annual average. The rains usually commence about the first or second week in November and last until the third or fourth week in April. During the winter following the rains the climate is a very pleasant one, with clear sky, warm days, and cold nights. About two months prior to the rains, however, the dryness of the country, combined with the heat and lack of vegetables, milk, &c., make it the least agreeable time of the year for Europeans. The natives, though not affected by the heat, suffer in many ways during this period; a great many of the vleis and water-pools have dried up, and the herds of cattle congregate at the more permanent waters, trampling out the veldt frequently for a radius of five or even ten miles, necessitating long journeys to obtain their food; their cows are mostly dry, there is little milk and no green food, and such diseases as spotted fever, influenza, and ophthalmia get a firm hold when they appear. The Protectorate lies, roughly, between 2000 and 5000 feet above sea-level, and only few people live at the cooler altitudes of from 4000 to 5000 feet. The portion of the country inhabited by the greater number of both Europeans and natives is adjacent to the only line of railway, which passes through the eastern side of the Protectorate for a distance of 403 miles; the average altitude of the stations and sidings along this section of line is 3418 feet.

St. Helena.—The estimated civil population on Dec. 31st, 1920, was 3718. The civil death-rate in that year was 8·87 per 1000, and the birth-rate 22·6. The health of the population generally was good throughout the year. A large number of the poorer inhabitants show distinct signs of malnutrition, for which the low rate of wages and high cost of living, owing to post-war conditions, are responsible. The importance of a properly qualified dentist being sent to the island at an early date cannot be over-estimated. The state of the teeth of the vast majority of the population is very bad indeed, and half of the time of the colonial surgeon and his assistant is occupied in making extractions. The mean temperature for the year was 63·0° F. The total rainfall as measured at Hutts Gate was 35·240 inches; at Plantation, 27·37 inches; and in Jamestown, 5·8 inches. There were 201 admissions to the hospital during the year, with six deaths. Dr. W. J. J. Arnold, colonial surgeon, who had been granted special leave for service during the European war, has returned to St. Helena.

NEW SUPPLIES OF RADIUM.

WE learn that supplies of radium may be expected in the future from two additional sources. It is intended to resume work on one of the mines in Cornwall which has been known for a long time to contain quite large quantities of mineral rich in uranium and its products. The Tolgarrick mine near Truro is the one in question; this is the property of an English company called Radium Ore Mines, Ltd., by whom new machinery has already been installed for the purposes of radium separation. The other source is an alluvial deposit in the interior of the State of Minas Gerses in Brazil. Though it has been known for some years that a radio-active mineral, euxenite, exists in this district, it has apparently been left to Mrs. Alexander Gross, F.R.G.S., to go and collect specimens from the district and have a quantitative test made of their uranium content. These tests, which were carried out in Rio de Janiero and at the Laboratoire de Recherches in Paris, under the direction of Madame Curie, proved that the percentage of uranium oxide in the specimens was such as to promise well for the undertaking the extraction of radium. This has apparently been taken in hand, and we await with interest the question whether these two further sources of supply will effect a reduction in the continued high price of the commodity.

NIGHTMARE FOLLOWING AN OPERATION.

AN unusual verdict of "Death through nightmare" has been returned at an inquest at Colchester upon the body of a man who had been operated upon in a nursing home. He had been put to bed, but during the night a nurse, who was in his room, heard a loud snore and found that he had jumped out of bed. His doing so was attributed to nightmare, and it had the result of breaking down the stitches and opening the wound. The efforts made to repair the mischief failed, and the patient died, his last words being "Tell the coroner and all of them that there is nobody to blame."

Messrs. H. K. Lewis and Co., Ltd., inform us that the English price of the Handbook of Leprosy by Ernest Muir, reviewed in last week's issue, is 10*s.* 6*d.* net.

R. M. F.—Surely either the surgeon himself, or one of the medical personnel in connexion with such cases, usually makes suggestive remarks to the patient in much the terms that are advocated.

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